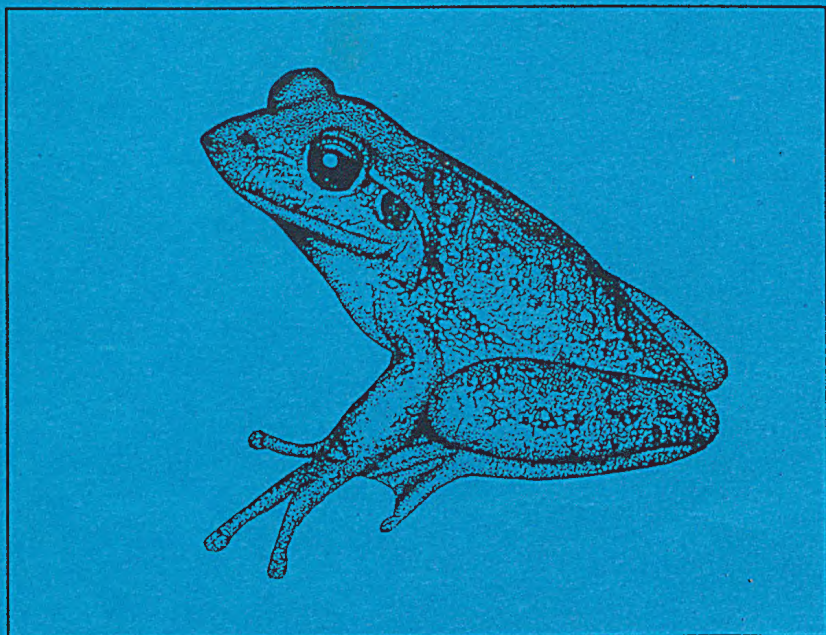


Australian Society for Limnology Inc.

NEWSLETTER



Littoria moorei: drawing by Shirley Balla

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AUSTRALIAN SOCIETY FOR LIMNOLOGY INC.

The Australian Society for Limnology Inc. (ASL) is an association of over 500 people with professional or amateur interests related to Australian inland waters. Since its inception in 1961, the society has played an important role in fostering limnology in this country. The ASL promotes liaison between limnologists in academic, government and private institutions and has a vested interest in the conservation of aquatic and related resources. Annual conferences are held near centres of limnological interest, and the programme includes scientific sessions, field excursions and social activities.

The ASL regularly produces a newsletter with notes on limnological activities, articles of interest, book reviews and announcements of upcoming events likely to be of interest to Members.

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Material for publication in the September 1995 Issue of the Newsletter should be sent to the Editor (see back pages) before **30th September 1995**.

Long articles should be forwarded as unformatted text on disk or to the editor via email. **BEWARE** encoded emails as we have limited access to decoders.

EDITORIAL

Apologies from me for another delayed newsletter - partly the fault of all ASLers who repeatedly ignore deadlines, such that every day after the 30th June I announce - "today I shall print the newsletter" and then in the mail arrive 3 disks, two faxes and an email - hmmm and partly due to my entire life and sanity being turned upside down as I was forced to move house - a generally confusing time where you lose all vital possessions to the one box hiding underneath 20 others, making quick recovery impossible. Aspects of this house moving experience, however, reminded me of the current 'hot topic' in Australian limnology - "Water for the environment - how much and when"! As the steam-cleaning of the carpets in the old house was finalised the vagrant Adelaide weather decided it was time to dump the entire quota of rainfall for July (*and possibly August as well*) on the city in a 15 minute period - the roof of the vacant house has withstood many downpours and periods of drought, with only a few occasional leaks. This sudden torrent, however, was too much and, what appeared like a large proportion of the rain falling on Adelaide, came through a join in the roof onto the very clean carpets. The old roof remains intact, but I fear the damage from this one event may be unrepairable.

The recent focus on environment flows for Australian streams and rivers, how much and when, is somehow analogous. In most situations there is a solid argument for giving water back to the environment - the battle is to make sure the entire quota for the environment doesn't all come at once. In this issue of the Newsletter we focus on some of the work being done under the National River Health Program - the 'Monitoring River Health Initiative' and the 'Urban R&D Sub-Program' as well as the Murray-Darling Basin Commission's - 'Sustainable Rivers Program'.

Cheers, and see you at Jenolan Caves.

DEADLINES FOR THE NEWSLETTER IN 1995

The following are the deadlines for the remaining issues of the ASL Newsletter Volume 33 (1995)

Volume 33	Deadline
September 1995, No. 3	30th September 1995
December 1995, No. 4	31st December 1995

FROM THE PRESIDENT

AGENDA FOR THE AQUATIC SCIENCES

Has Australia's awareness of aquatic systems and what we know about them increased? Or is it just that my awareness has increased? In the past three months I have noticed several things that are important to our science.

The Federal Government gave a substantial increase to funding of wetlands and our coastal zone. The wetlands funding to the Wetland Unit of the Australian Nature Conservation Agency is not unrelated to the 1996 Ramsar Meeting in Australia and some of it should help Australia get its act together on conservation and management of its wetlands - both Ramsar sites and other wetlands. The development of 'The Wetland Policy of the Australian Government' is also being pursued by ANCA. This is a development that ASL should take an active interest in and I anticipate that there will be ways in which we can participate in its development.

Recent press releases tell us that there is to be a moratorium on new water licences for irrigation extraction of water in the Murray Darling Basin. The fact that ministers from Queensland, NSW, Victoria and South Australia have agreed to this gives an indication of the intention for some real Basin-wide changes. The statements on this issue express concern about loss of diversity and degradation of the aquatic ecosystems. Will this mean real changes to ensure the water needs of the rivers and their wetlands are considered?

A new "Science Policy for Australia in the 21st Century" has been launched by FASTS in Canberra. As a member organisation of FASTS (The Federation of Australian Scientific and Technological Societies) we should look closely at this new policy to see what we can do to help meet its aims at the same time as we see which of our own aims it may help achieve. At the September Meeting of ASL we hope to be able to discuss FASTS and its policy with a member of the FASTS Board, (Prof Jason Middleton who represents marine sciences).

And last but by no means least, congratulations from ASL to Arthur McComb on his election to the Australian Academy of Sciences. This prestigious achievement is one all ASL members should be proud of. There have not been many aquatic scientists recognised in this way.

I am looking forward to the ASL meeting at the Jenolan Caves. See you there.

Margaret Brock
July 1995

PRATTLEBUTT, SCUMOUR AND RUTTLE

PAPUA NEW GUINEA

from: Ian Roderick

Life in Tabubil is currently very wet, due to the onset of the 'clag' season - frequent rain and plenty of ground-hugging cloud cover - though once in a while the sun manages to peek through. This generally doesn't interfere with the biological sampling program, so the regular monitoring has continued as normal.

Recently, a second waterbird census of the middle Fly River floodplain area was conducted by **Stuart Halse** and **Grant Pearson** (W.A. Dept. of CALM), **Roger Jaensch** (Asian Wetland Bureau), **Paulus Kulmoi** (PNG Dept. of Environment and Conservation), **Phil Gregory** (Tabubil International School) and **Andrew Storey**. Numbers had decreased by tenfold from >500,000 of 57 species in the dry (December) to approximately 55,000 of 36 species in April, as the birds had dispersed during the wet season. Generally, numbers were again dominated by fish eaters such as egrets, herons, darters and cormorants. Jacanas, Spotted Whistling Duck and Magpie Geese were recorded as breeding in April.

Dr Robyn Watts from DPI's Southern Fisheries Centre in Queensland spent approximately 1 week with us assisting with the collection of *Nematalosa* spp (Freshwater Herrings) for a population genetics study that she will be conducting. The main aim of this will be to determine how distinct the two species (*N. flyensis* and *N. papuensis*) really are, and whether each oxbow lake holds separate or connected populations of each species.

Currently on site are **Greg Johnston** and **Paul Mazdon** from Flinders University, conducting further field studies on the local froglife, as well as some behavioural work on Green Tree Pythons.

Kenneth Kambanei, one of our Fisheries Technicians, recently spent 2 weeks at ERISS on a staff exchange scheme, where he assisted with the annual floodplain pop-netting campaign. He thoroughly enjoyed himself and in addition, gained some valuable work experience. It is intended that the scheme will be on-going, so we should be playing host to another ERISS technician later this year.

Boga Figa has returned to Tabubil for his mid-year break to collect samples and conduct some laboratory work for his postgraduate diploma at James Cook University, Townsville, examining copper regulation by freshwater mussels as a preliminary to establishing a monitoring programme.

At the end of June we will be losing **Andrew Storey**, who has been the Senior Biologist for the past 2 years. He will be returning to the browner pastures and bigger surf of Perth, where, in Andrew's own words, he and Darcy are also about to become heavily involved in the Real Estate business, as next month they are adding another Storey to the household! If he is not too burnt out from sleepless nights and copious nappy changes, he will also be working at the University of Western Australia! His contribution to the Environment Department, and in particular the Biology section, has been valuable and his presence will be missed.

During the last week of August, OTML's Biology section will be hosting the 5th Annual Meeting of the Biological Society of New Guinea, with delegates attending from Papua New Guinea and Irian Jaya. The logistic difficulties experienced in getting everyone on site should be more the offset by the resulting exchange of ideas and information.

VICTORIA

Victoria University of Technology

from: Paul I. Boon

Only a few things to report from here. Quite a few limnological Honours projects have started this year in Environmental Management: 1) **Leonie Johnstone** is working on why *Melaleuca* leaves decay so slowly in wetlands (it's to do with antimicrobial compounds spoiling the life of the bacteria and fungi, we reckon); 2) **Mat Cattanaach** is trying to find the source of the antibiotic resistance so common in aquatic bacteria. We had pointed the finger at the pharmaceutical industry, but they now seem to be off the hook....; 3) **Simone Mol** is using the Dynon Road drain near Footscray to determine how many nasties are washed in the Maribyrnong River each time it rains or the drain is dredged; 4) **Georgena Henneberry** is doing dreadful things to yabbies to see how many heavy metals they can take up at once; and 5) **Rasmita Mishra** is playing around with urban wetlands for runoff treatment. They all beaver away in an ex-food-technology laboratory, while the new and much longed-for Wet Laboratory is being built. I had my doubts this mythical beast would ever materialise, but even as I type the concrete foundations are being poured. This lab will give us some super duper space dedicated to aquatic research.

Tim Doeg's article on PaRm schemes rang a familiar bell with me, as we also are going through the fiasco of Enterprise Bargaining. The University's senior management have come up with the brainwave that, in addition to the undergraduate contact time of 12 hours per week that all academics at VUT are meant to undertake, it would be a good idea if there was a fixed semester schedule of 10 hours weekly minimum access to staff for undergraduate student consultation outside formal teaching activities. As it takes at least 2 hours preparation/marking for every contact

hour of undergraduate teaching, their ingenious scheme will mean I have >46 hours dedicated to undergraduates alone each week. Mind you, I'm only employed for 37.5 hours per week. With mathematical competencies like these, this senior management team is just the one we need to undertake the forthcoming review of the Maths and Stats Departments. One does wonder what is meant to happen to Honours and postgraduate students, or even to research. Of course, the really important activity of an academic - administration - cannot be allowed to suffer. You are not alone Tim! It is clear that these senior managers live on another planet; and that there's no intelligent life there.

La Trobe - Albury-Wodonga

from: Susan Lawler

Lor-Wai Tan has begun a Ph.D. project under the supervision of **Susan Lawler** at La Trobe University (Albury/Wodonga) on the taxonomy and systematics of testate amoebae. She hopes to combine comparative studies and ecology with molecular techniques to increase our understanding of these organisms. Lor-Wai has successfully cultured several lines from Ryan's Billabong and has been able to extract DNA from them, all within the first month of her degree. At this rate we expect her to revise their taxonomy, delineate their ecology and set them up as biological indicators by the end of the year!

NEW SOUTH WALES

AWT EnSight

from: Julie Currey

Once again we regretfully report some further departures from the group since the last report: **Dianne Flett** has joined Sydney Water's Stream Watch group, and the tireless **Tracey McVea** has returned to her old stomping ground at NSW Fisheries Research Institute to work with **Philip Gibbs**. We wish them both a lot of luck. Fortunately **David Holleley** has returned from his jaunt around-Australia and we will hopefully return to a state of organisation pretty soon.

The autumn round of sampling for the various National River Health Program projects has been completed. **Nicola Plunkett-Cole** and myself have had a great time of it, and have completed sampling for our project "The evaluation of attached diatoms for the assessment of river health". I'm sure by now we have stayed in every small middle of nowhere town and probably met every colourful character in NSW. The hard slog of identifying samples has only just begun.

Bruce Chessman, Jane Growns and **Rod Hardwick** have begun work on a new survey for the Forestry Commission in Gloucester Tops. The survey will cover fish, invertebrates and aquatic vegetation. **Michael Currey** has joined our group from his previous position in the Beaches and Estuaries group. He has taken on the mammoth task of running the routine water quality monitoring programs for Picton, Warragamba and Werriberri. **Hugh Jones** has begun work on the final water quality report for Mount Hunter. **Brendan Atkins** recently covered an in house (AWT) workshop on constructed wetlands. He is currently involved in coordinating a wetland survey of the Hawkesbury River in Gosford.

Water quality and pollutant-transport studies on the Lake Burrator (Warragamba Dam) catchment by **Dianne Flett, Hugh Jones, Carla Kinross** and **Mike Manille** are now in draft. **Peter Swanson** continues with his report on the performance of gravel beds for polishing effluent. It is expected that this work will be presented in Townsville at the "Wetlands for Water Quality Control" conference. **Ivor Grown**s, with some help from **Carla Kinross**, is working on several reports; contaminants in fish, effects of river regulation on invertebrate and diatom communities, and effects of water flow regulation on aquatic flora and fauna.

Dave Ross is moving ahead in leaps and bounds having completed invertebrate ids, he is now writing the report for the NSW MRHI program for Hunter, Shoalhaven and Hawkesbury systems. **Cathy Cantwell** and **Amanda Kotlash** still are plugging away with the invertebrate ids for the Hunter River catchment survey. While **Simon Williams** is continuing work on the macroinvertebrate survey of the Hawkesbury / Nepean River system. **Yoshi Kobayashi** is expecting to finish his report on the feeding preferences of zooplankton of Hawkesbury-Nepean River in the next few weeks. **Maria Marzella** is wrapping up work on the monitoring and evaluation of alternative sewage treatment systems, and has taken up the challenge of QA/QC for invertebrate lab and is being trained in family level invertebrate identification.

Paul McEvoy is busy planning his next round of field work but fortunately the times of frantic sampling have, for now at least, subsided, and most people are settling down to spending time with the microscope and writing reports.

University of Technology, Sydney

from: Richard Lim

Things are frantic at the moment with getting abstracts in for the ASL congress and paper presentations for the 2nd Australasian Society for Ecotoxicology (ASE) conference. On the research front we have finally commissioned the stream mesocosms at the university's field station near Stroud. A year's worth of study will be carried out to get some insight to the functioning of the system before we dose them with nasties. **Anne Colville** has come on board to assist in the project. At the Centre for Ecotoxicology, **Michael Warne** is continuing his work on the toxicity of phosphate

containing and phosphate free detergents to waterfleas. **Ross Hyne** is getting stuck into sediment ecotoxicology. He is at the moment looking for appropriate test organisms to use for his experiments. **David Everett** and **Victoria Adair** are involved in his research. With **Scott Wilson** he is testing the impact of acid sulfate water on juvenile Australian Bass. **Rick Krassoi** has almost completed a series of laboratory studies on the toxic effects of chlorpyrifos to cladocerans and shrimps. **Sunderam** is currently experimenting with various fish species for early life stage (ELS) toxicity testing while **Moreno Julli**, has been assessing the toxicity of slag leachate in between managing the Centre's laboratories. **John Chapman** has been maintaining the pulse of the Centre's research at a fairly brisk pace while also managing the editing of the recently launched Australasian Journal of Ecotoxicology (he will gladly accept subscriptions).

Griffith CSIRO Division of Water Resources.

from: Shaun Meredith

We have a new leader! The void left by **Kath Bowmer** as program leader has been filled by **Dr Richard Davis** from the Canberra lab. He brings to our program his project group from Canberra working on bigger and better ways of communicating the science we do to the managers that matter, skills which are no doubt going to benefit everyone. So all hail the new King! Hail Richard the First!

Other than that, all's pretty quiet on the mid-eastern front. Griffith is undergoing a hibernation with the cold snap (also known as the brandy snap) that is tormenting limnos in non-tropical Australia. The ins and outs since our last communication contain no outs and only one in, that being a new research assistant by the name of **Brendan Ebner**. He is a Queenslander, but has some (limited) compensatory endearing qualities including a flair for cartoons (which we will try to show in later ASL issues) and a love of fish. He has joined the team to work on the "Carp Project". Welcome Brendan, and no, we don't want to talk about the state of origin series. As for the rest of **Jane's** project, we have been without our leader for a month as she gallivanted around America and the UK attending workshops with the Society of Wetlands Scientists, and a 3 week course on "Advances in Ecology". She has been back for a few weeks now and is still climbing over the mail pile to her desk. Perhaps a grant from Australia Post isn't out of the question. **Peter Fairweather** is still in detox trying to purge the evil salt from his veins and concentrate on the world of freshwater. 'Twixt meetings, workshops and conferences, Peter can be seen hooked up to the 'desalinator 2000', a series of works on mangroves and the like which are dangerously close to completion. Students are writing and experimenting, **Andrew Palmer** is working on the Chowilla stuff. In general, finality is in the air, and we're all blaming the dog.

Wolfgang Korth's project is churning out the results of a recent pesticide project, writing volumes on pesticides in Mirrool Creek, Little Mirrool Creek and the Irrigation

Area for various departments. A recent "Mini-Symposium" on water quality guidelines with particular reference to pesticides was held here about a month ago, with much heated debate from land-holders, government groups, managers and scientists. Next time we are going to sell sedatives at the door in order to fund building renovations. Gillian Napier is busy preparing for the Ecotoxicology conference in a few weeks where she will present a paper on her biosurvey work while the rest of the team prepares for the next round of pesticide work. For those interested, Wolf's handicap is still at 12, and it is the short game that is the problem.

Gary Jones is also in writing mode, pumping out the papers with one hand whilst talking on the phone with the other and attending conferences and workshops with the other. Old 'three hand Jones' is also working with David Bourne (a.k.a. Mr Floppy) looking at cyanobacterial toxin degradation by bacteria and the incorporation of these bacteria into slow sand filtration units and into natural systems by open seeding. Phillip Orr grinds slowly away on an ASPAB conference paper, the noise is excruciating.

That's about it for the Griffith Outpost, other than to let you know that if anyone owns a set of thermal underwear, we've got a few ex-Queenslanders who are willing to pay just about anything at the moment.

WESTERN AUSTRALIA

CSIRO Division of Water Resources

from: Lloyd Townley (lloyd@per.dwr.csiro.au)

Since this is the first time we've contributed to the ASL Newsletter, let me give a brief introduction to the interests and background of one particular group in DWR Perth. We have about a dozen people in a Research Project entitled "Interaction between groundwater and surface water", within a Research Program entitled "Groundwater management and site remediation". The group has extensive experience in: the prediction of groundwater flow patterns near lakes, rivers and streams; the use of chloride and natural isotopes (deuterium and oxygen-18) to trace groundwater movements; and water balances of surface water bodies. Our link to ASL and the field of limnology is through our interest in processes that keep wetlands wet, processes that affect or control water quality, and increasingly in groundwater ecology.

Dr Jeffrey Turner, who is the Project Leader, is currently finishing two major reports: one on Lake Jasper in the D'Entrecasteaux National Park, and one on paleochannel aquifers in the Eastern Goldfields, including interaction with salt lakes such as Black Flag Lake. He is also participating in studies of the Yalgorup Lakes (Clifton, Hayward and Preston).

Dr Lloyd Townley is leading a study of the hydrology and water quality in final voids left by open cut coal mining in the Bowen Basin in Queensland. He has recently been joined by **Dr David Ellerbroek**, a postdoc from Colorado.

Dr Claus Otto is continuing monitoring of groundwater near Lake Cooloolungup, following a recent study in that area.

Dr Bill Linderfelt has just joined the group as a postdoc from Arizona. Bill will be playing a major role in our study of density-driven groundwater movements into and out of the Swan River, funded by the Estuarine Research Foundation. He will be interacting closely with **Dr Grant Douglas**, whose formal home is in another Project in DWR.

Tony Barr is continuing to develop computer models for surface water - groundwater interaction, including FlowThru, which has been developed specifically as a teaching tool, to help students visualise groundwater flow patterns.

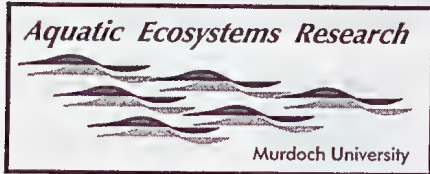
Members of our group are co-supervising five PhD students and one Honours student at nearby universities. **Declan Morgan** at Murdoch is investigating carbon-13 systematics in humic acid substances which are prevalent in coloured wetlands. **Tony Smith** at Murdoch is developing theoretical and numerical models of seasonal fluctuations in groundwater flow patterns near surface water bodies. **Jannette Nowell** at Murdoch is developing dynamic and spatially varying models for the interactions between *Baumea*, *Typha* and *Melaleuca*, including simple models for water level fluctuations. **John Rich** at Murdoch has just completed a report on our group's recent monitoring at Perry Lakes, and will soon start his own field investigations, focusing on seasonal dynamics and the effects of artificial water level maintenance. **Alexander Alexandrov** at Murdoch is developing mathematical methods for solving so-called moving boundary problems, such as where the shoreline of a shallow lakes migrates seasonally. Finally, **David Sim**, an Honours student at UWA, is carrying out water balance studies at Shenton Park Lake.

from : Grant Douglas

Dr Grant Douglas and **Dean Coad** from the CSIRO Division of Water Resources continue their work on the Swan River Estuary using in-situ domes (benthic chambers) at five sites to determine nutrient release rates from bottom sediments. Initial results suggest that there is substantial nutrient release (P, N and Si) from bottom sediments under both oxic and anoxic conditions. This research eventuated as a result of corporate sponsorship (\$100K) from BankWest who are celebrating their centenary.

Murdoch University

from: Kerry Trayler (trayler@central.murdoch.edu.au)



Like the name?

What about the snappy little logo?
it looks even better in colour.

We figured that WET (Wetland Ecology Team) wasn't quite broad enough to fit our profile these days, and AqER couldn't be any worse than the acronyms emerging, in ever increasing numbers, from the east. We've included a recent photo of the AqER crowd, but there have been a few changes since it was taken: **Faye Cheal** has scarpered off to QLD; **Jane Latchford** has changed sides and joined the Marine and Freshwater Research Laboratory and we have been joined by two new students, **Frederick Bouckaert** and **Sabaruddin Tjokrokusumo**.

Frederick is undertaking an honours project examining aspects of stream hydraulics using a recently developed whiz-bang piece of equipment known as an acoustic doppler velocity meter. Saba has just arrived from Indonesia and will be undertaking his PhD during his time with the group.

A new calm has overcome the AqER lab of late. This is due to the fact that **Jenny Davis** and **Faye Cheal** have completed the draft of "Wetland Wonders: A Guide to the Macroinvertebrates of the Swan Coastal Plain", and everyone is breathing a sigh of relief. It will be a while before the final version is out, so watch this space.

Books appear to be very popular at the moment. "Wetland Plants of the Southwest" by **Jane Chambers**, **Arthur McComb** and **Nicola Fletcher** is hot off the press (see next edition for details) and "Eutrophic Shallow Estuaries and Lagoons", edited by **Arthur McComb** has recently been published and is available through CRC press.

On the subject of estuaries, **Ian Potter's** Estuarine Research Group has been funded by FRDC to look at the influence of the Dawesville Channel on the fish fauna of the Peel Harvey system. **Liesl Jonker** and **Simon De Lestang** will be working on that project in conjunction with **Glenn Young** and **Angierita Konandjembo**. Glenn will undertake his PhD and Angierita, who has just arrived from Namibia, will undertake a Masters degree.

Photo: Aquatic Ecosystems Research team as at April 1994

Back row: Jenny Davis, Richard Segal, Jane Latchford, Declan Morgan

Front row: Phil Papas, Lorna Charlton, Faye Cheal (QLD branch), Kerry Trayler

Absent: Poranee Utayopas



Curtin University of Technology

from: Jacob John

The School of Environmental Biology has been teaming with heaps of limnological activities. **Lily Nonboro**, an AIDAB postgraduate student from Mozambique, has started her studies on water quality monitoring in Canning River - a tributary of the Swan River estuary. **Wilma Vincent** is writing up her Honours thesis on two years work on phytoplankton dynamics of the Canning River during which she witnessed one toxic Cyanobacterial bloom in the river. **Stephen Chase** has been monitoring the Peel-Harvey system at Mandurak for the past two years. After the channel has been built, no *Nodularia* blooms have been observed. He is busy completing his Honours thesis - tackling a mountain of data. **Melanie Ward** has been trying to grow some Charophytes in the RGC Wetlands Centre, managed by RGC Mineral Sands at Capel, as part of her Honours work.

In addition to supervising the above Honours studies, Dr **Jacob John** has been busy guiding **Michelle Handley** who is busy writing up her MSc thesis on the limnology of the salt lakes at Esperance and Kambalda, and **Kylie Ashenbrenner** adding finishing touches to her MSc thesis on microbial communities in the artificial wetlands at Capel.

Dr **Jacob John**, in collaboration with Dr **Peter Thompson** of CSIRO, has received funding to unravel the algal bloom problems in the Swan River estuary from the

Estuarine Research Foundation, and **Jane Rosser** has joined Curtin University to do her PhD under this project with a scholarship from the Foundation. **Dr Rob Rippingale** also received funding to study the zooplankton phytoplankton interactions. **Sandra Griffiths** has joined the School to do a PhD under Rob on this project.

Stuart Hellenen, after obtaining a MSc degree on the wetlands of Perth, has started a PhD program on Silicoflagellate blooms in Perth coastal waters on a scholarship, also under Dr Jacob John.

Dr Jacob John has commenced research on the use of diatom assemblages as tools for monitoring rivers of Western Australia, in collaboration with the Waterways Commission funded by the Commonwealth Environmental Protection Agency under the National River Health Initiative managed by LWRRDC (he presented a paper on the project in Canberra in the 2nd Biomonitoring Workshop organised by LWRRDC held in May). **David Tiivel** has joined this project as a Research Assistant and as a PhD student under Jacob John.

Dr Jacob John has also been busy organising the scientific program for the 5th Intecol's Wetlands International Conference to be held in Perth in 1996, as its Program Secretary. Jacob has accepted an invitation to join the state management committee for hazardous algae as an adviser. He will be part of a team conducting a workshop on water quality in July for the University of Brawijaya in Indonesia and will present a paper on "Biomonitoring of rivers - what are the ideal biomonitors?"

TASMANIA

from: Jean Jackson

Congratulations to Frances and Henry, now parents of a baby boy.

Inland Fisheries Commission

The State government is to provide \$1m for work on The Carp Problem. Several new 2-year full time positions have just been advertised.

Department of Primary Industry and Fisheries

The freshwater group at DPI is growing, with **Mark Nelson** and **Nick Probert** working on a new 3 year environmental flows project funded by Landcare. Mark's new position with the river health team has been filled by **Tom Krasnicki**. **Henry Maxwell** continues to work on the recovery of the great Forester River after a pyrethrum spill.

Zoology Dept., University of Tasmania

Leon Barmuta leaves on July 1st for the US for a few months study leave. The big \$\$ news item is that **Leon** and **Peter Davies** have successfully bid for work on the Mt Lyell mine (Queenstown) remediation project funded by ERISS and DEST. **Leon's** ARC project on near bed flows, which **Ed Chester** has been working on, is successfully finishing up. **Belinda Robson** nears the end of PhD thesis-writing, and **Martin Read** has finished sampling for his study of willow and native riparian vegetation and stream communities.

Odds and Sods.

Jean Jackson has been appointed as co-ordinator of the urban R&D component of the National River Health Program (see article). The Hydro has agreed to release water from some of their dams at the whim of **Peter Davies**, for his new hydro schemes flow project. Let's hope the power (ha ha) doesn't go to his head!

ACT

Bureau of Resource Sciences

from: Michele Barson

I attended the recent FASTs Policy Launch on behalf of ASL. *See report elsewhere in this issue.* FASTs are keen to talk to all their member societies and **Jason Middleton** (Marine and Aquatic Sciences representative on the FASTs Board) has agreed to come to the AGM at Katoomba. My next trip up the Hill to Parliament House was to demonstrate to the Prime Minister's Science and Engineering Council the importance of land cover, the impact of land cover change on greenhouse gas emissions, land degradation processes and biodiversity and how we were planning to spend the \$3.6 million we have recently received to prepare a 1990 land cover map of Australia and a 1995 change map. The digital data sets will be made available on CD ROM and should be of immediate use at the national, state and catchment level. The PM was particularly impressed by the Helmeted Honey Eater (we used the HH story to show the impact of land clearing on biodiversity); noting that it had "a hair do just like that of a certain southern state politician!" At the same meeting **Peter Cullen** presented his and **Kath Bowmer's** paper on "Agriculture, water and blue green algal blooms". PC advised the PM that algal blooms were the original scumbags. **Karen Markwort** (our new CRC correspondent) provided an enormous billboard display for the meeting. It fell on her twice while she was installing it. I'm sure she was relieved to hear that it didn't decapitate any of the distinguished guests during the day.

Cabinet has now considered the paper on "Economic measures and the reduction of nutrients from agricultural run off in waterways" prepared by BRS and ABARE staff. It will shortly be published by the Department of Primary Industries and Energy and will be available from the DPIE Shopfront (freecall 008 020157) by the end of July.

CRC for Freshwater Ecology,

from: Karen Markwort

Wanted! Fur-lined waders for Thredbo study

Researchers and staff from the CRC for Freshwater Ecology will brave the icy Thredbo River to conduct the second stage of the project, 'Relationships between nutrients, algal growth and macroinvertebrates in rocky and soft bottom streams'.

This July expedition is not just an excuse for a skiing trip, but to determine whether epilithon will grow in the stream during winter in the absence of macroinvertebrate grazers. It follows similar work which was conducted last summer.

The work, being led by Drs Richard Norris and Bill Maher, involves using in situ artificial stream channels and paving bricks for the sampled substrata. Invertebrates will be excluded from the two-thirds of the channels for two weeks using electrified wires. If algal growth does increase, the electricity will be removed to determine how quickly the macroinvertebrates will graze the algae to levels similar to those in the non-electrified channels.

The summer experiment resulted in a massive increase in the growth of epilithon which was grazed back to normal levels within a few days.

The project is funded by the CRC for Freshwater Ecology and supported by Kosciusko-Thredbo Pty Ltd.

New lab for Water Studies Centre

The Water Studies Centre, Monash University, has installed a molecular/ecology laboratory. Completed in May, the laboratory, has received PC2 accreditation (Physical Containment Level 2) to perform DNA cloning (genetic recombinant molecular work).

Dr Jennifer Ross and Prof Barry Hart are using the laboratory to run a project on Microbial Indicators of Aquatic Health. The aim of the project is to use microorganisms as biomarkers of the processes and health of aquatic systems.

Scientists have only just begun using bacteria to assess river health, Jenny says. This has been made possible by new molecular techniques which have allowed scientists to

gather information from bacteria directly from the environment without the need to culture the sample.

Four main projects are underway in the laboratory:

1. Methane cycling studies in collaboration with **Paul Boon (VUT)** looking at how methane produced in the sediments is short-circuited by methane oxidising bacteria.
2. Combining molecular probing with Field Flow Fractionation (FFF) techniques with **Ron Beckett**. FFF allows very accurate measurement of microbial biomass. When FFF is combined with the molecular probes, the biomass of different components of the microbial population can be determined.
3. Studies of microbial populations in the Darling River in collaboration with **Mike Grace**.
4. Graduate CRC student, **Jennifer Driessen**, started last Feb and is being supervised by Jenny and Barry to study nutrient cycling at several river sites around Victoria.

For further information, contact Jenny Ross. Phone: (03) 9903 2420.

Email: jross@silas.cc.monash.edu.au

SOUTH AUSTRALIA

from: Fran Sheldon

University of Adelaide Botany and Zoology Departments

The recent drought breaking, continual, soggy rains in Adelaide appear to have sent most of the limno's of University of Adelaide into a fieldwork frenzy or to other countries.

The intrepid goat killer and oyster eater, **Sam Wade**, has headed north again to his field sites in the Flinders Ranges. He is continuing experiments into nutrient dynamics in temporary streams.

Stuart Blanch, Justin Brookes and Kerri Muller, under the watchful guardianship of **George Ganf**, have fled the rain soaked country and headed for Brazil! In between sight-seeing ventures to the Amazon they will be presenting papers at SIL. (*Postcards from the Sedge and Conference Reports are expected!!!*) In the absence of **Stu Blanch, Adrienne Burns and Lorenzo Vilizzi** are continuing with the Lock 8 flooding trial on the lower River Murray, with financial assistance from a small grant through the Murray-Darling Basin Ministerial Councils Natural Resources Management Strategy. **Keith Walker** is in the middle of teaching a week long course explaining the

delicacies of SYSTAT to Graduate Diploma Students. his band of Honours students are working around the clock.

John Bradbury continues to work in collaboration with **Bill Williams** on a taxonomic revision of the Australian freshwater amphipods. Thus far this year, four papers have been completed and submitted (it is wonderful how productive one can be in retirement!). One of the amazing facts discovered by John involves a huge diversity of the underground fauna. Thus, on Barrow Island alone there were some eight new species (just about every bore hole or cave had a new form). A poster is being prepared for the ASL conference on amphipods and this will bring up to date general knowledge on the group.

Angel Ghassemzadeh continues working on the salt ponds at Dry Creek. Her research is showing just how important viscosity can be in the biology of the ponds. She is also finding that salt errors in the determination of some ions is significant.

Bill Williams continues as editor in Chief of *The International Journal of Salt Lake Research*, and *Reservoirs and Lakes: Research and Management*. He has also been appointed to a number of national and international committees (*see Announcements section*). In research, he continues working on the ecology of salt lakes, particularly (with **Jenny Day**, of UCT, South Africa) on DOC, on amphipod taxonomy, and on the biology of the newly discovered athalassopedes, a most remarkable new phylum of animals found only in saline lakes.

Australian Water Quality Centre South Australian Water Corporation

The Monitoring River Health bods **Peter Goonan**, **Chris Madden** and, for a few more weeks, **Fran Sheldon** are well into counting the 2nd survey and are about to undertake a thorough review of mite taxonomy in South Australia, reducing the 70+ taxa to a more manageable number.

The original blue-green algae research team of **Mike Burch**, **Peter Baker**, **Renate Velzeboer**, **Jenny Mole** and **Mira Orlovic** has been reduced to just Mike, Peter and Jenny as Mira holiday's in Croatia and Renate heads for 5 weeks break in Columbia - the only words from the lab were "we're flat out"!!

Peter Schultz and **Sally Aebi** from the Wetlands Monitoring and Macroinvertebrate Section continue with their regular sampling of exotic locations such as 'Bird in Hand' and 'O'hec'. Peter is preparing for a media liaison day with **Angry Anderson**, 100 primary school children and 150 secondary schoolers at the Murray Bridge 'poo ponds' - watch for news reports.

The entire ASL community in South Australia is preparing to host ASL 96 - keep tuned for more details.

NORTHERN TERRITORY

ERISS - Wetland Management Section

from: Ruth O'Connor and Bob Pidgeon

From the bug lab....Our early dry season sampling extravaganza is over - just as I was becoming accustomed to being able to walk barefoot in streams AND drink the water! This means **Chris Humphrey's** estrangement from his computer is at an end and the rest of us face the microscopes. **Andrew Jones**, has already suffered bug burnout doing the midnight to dawn shift in his study looking at spatial variation of communities in sand habitats. Another UNE recruit, **Bill McFarlane** is at the final stages of data collection for his project looking at the diet of Mariana hardyhead and the effect these beasts have on poor unsuspecting macroinvertebrate communities. In the process, he has stumbled upon a great limnological mystery - 60 disembowelled fish in a creek inclosure (clues: no survivors, no fat birds around). Any solutions to who (or what) dunnit will be gratefully accepted.

News on the ecotoxicological front is that tests for the revision of ANZECC guidelines are going well and **Scott Markich** from ANSTO is due to visit in July to continue with the collaborative work. **Caroline Camilleri** and **Max Finlayson** have just attended the Australian Society for Ecotoxicology conference in Sydney to present a paper on 'Ecotoxicology in the Wet/Dry Tropics of Australia'.

The newly-formed wetland ecology group in the Wetland Management section, which at present comprises a mixture of desperate vegemites (**Max Finlayson**, **Kym Brennan**, **Ben Bayliss**), fishos (**Bob Pidgeon**, **James Boyden**, **Dave Walden**) and an ex rock-chopper (**Ray Hall**) is presently engrossed in their first task of evaluating the potential effects of predicted climate change on the wetlands of the Alligator Rivers Region. This is a short "desk-study" project, to be completed by mid-August. It is one of 8 projects in the DEST program on Vulnerability to Climate Change. The outcomes of these projects will form the basis of Australia's contribution to the Inter-governmental Panel on Climate Change which provides technical advice to the Climate Change Convention. The other task embarked upon after the Wetland workshop in March was the development of a Meta-database for the region. Unfortunately this is far from operational so it has missed a great opportunity with this climate change exercise. Ah well....the next crisis perhaps?

EULOGIES FOR SHIRLEY BALLA

DR SHIRLEY BALLA

A sad insert for the ASL Newsletter and a great loss to the Australian limnology community; Shirley Balla lost her long battle with cancer in May 1995. For those of us fortunate enough to know her, the battle she fought was a demonstration of her enormous inner strength - she will be missed by many ASLers. A few of her many friends and colleagues, here express their memories.



Australian limnology has lost one of its quiet achievers

Before she went on to bigger things, Shirley's MSc research at the University of Adelaide concerned shape variation in the freshwater mussel *Alathyria jacksoni*, a species that occurs only in the main rivers of the Murray-Darling system. The shells of *A. jacksoni* have a blade-like dorsal "wing" in moderate currents, but a pronounced dorsal arch in strong currents. Shirley argued that the changes in the shell were a consequence of environmentally-induced modifications of the internal organs. She used electrophoretic methods to confirm that the two growth forms were conspecific, and in the course of this work she discovered that another species, *Alathyria condola*, was much more widely distributed than previously thought (it occurs in the Murray proper, as well as the Murrumbidgee and Lachlan drainages).

Shirley was part of a close-knit group of Murray postgrads that included Lance Lloyd, Jane Moller, Bryan Pierce and Jim Puckridge. She gained enormous respect for her strength in the face of adversity -- both during her graduate studies, when she battled on without scholarship support, and in the years when her health began to falter. She was ever a willing confidante for fellow students, and undergrads and postgrads alike will recall her good-humoured encouragement and her readiness to help. We shall all remember her with the greatest affection.

Vale Shirley -- we have lost a friend, and Australian limnology has lost one of its quiet achievers.

Keith Walker

As difficult as it is for me to write about Shirley, I believe that it is important to record her life and the impact she has made on others. What follows is a personal reflection on her life and work.

For me, she made an impact that will last a lifetime. Shirley and I shared a good many things in our lives. I first met Shirley as a fellow M.Sc. student as we shared an office at the University of Adelaide's Zoology Department. We shared a supervisor, we shared field trips, projects (consultancies and papers), scientific interests (wetlands) and bad times (e.g. the death of a close relative, departmental storms, etc.). These were important times for me, and Shirley was part of this. Her resolution and commitment to her work were second to none and demonstrated to me that you can do anything if you believe you can.

Shirley's renowned tenacity of spirit was an inspiration to those who knew her in her student days as well as in the most recent years as she struggled with her cancer. This tenacity allowed her to overcome personal grief with the sudden death of her father soon after she started her M.Sc., to complete an M.Sc., to sift large amounts of information to produce (with me) a compendium of facts on SA wetlands, to complete a Ph.D. and a series of books on WA wetlands. This tenacity sometimes meant that Shirley awakened irritation in others who were not able to see her goal, but she mostly set an example for others to only hope to follow.

Her honesty in most situations was breathtaking (a spade was really a spade) - on her learning of her initial cancer she wrote telling me this and in reply I wrote that I was "deeply shocked to hear of her news" and "didn't really know how to respond". She wrote back a few days later saying "well I thought that you would never talk to me again if I died without telling you"!!!! Somehow, this allowed us to continue our communications with an openness that allowed discussion of her illness without it taking over our professional and personal relationship.

Those who knew Shirley, will know her passion for natural systems was not only reflected in her commitment to science and public knowledge but also her fine abilities as an artist and scientific illustrator. Many of you will have seen her line drawings in ASL newsletters (and a calendar one year, I think) but I know she has produced a range of colour drawings of fish and invertebrates. Perhaps these could now be collated and reproduced for all to appreciate.

Shirley's death brings to an end a fruitful life, her achievements were quite outstanding given her (relatively) short life and other pressures brought about by temporary employment and other "ills" of graduates of the 80's.

I will miss her as one of her friends and colleagues. Nonetheless, she continues to give me inspiration to achieve all those goals which are most important to me.

Lance Lloyd.

I first met Shirley in June 1988 when I started my Ph.D. at Murdoch University. The thing I remember most about that meeting was that I was stunned that so much personality could be packed in someone so small. I still hold that view today. They say that some people are more equal than others, well, Shirley was more unique than anyone I have met for a long time. I can't list her unique characteristics because they are too hard to define. But her generosity and enthusiasm for life were among her better qualities.

I miss Shirley and I think that the Limnological community has lost one of its more valuable members. She has the distinction to have survived the most number of my Ph.D. field trips than anyone and I can still hear her tap-dancing down the university corridor.

Ivor Growns

60 MINUTES

ASL Executive Teleconference, 28 April 1995

Present: M.Brock, R.Marchant,
J.Jackson, P.Boon, G.Closs, M.Barson,
S.Blanch, M.Lund

Apologies: M.Hart, J.Growns

1. **Report from J.Growns (via secretary):** Registration forms for the forthcoming ASL congress in September have been sent to the newsletter editor and will appear shortly with the newsletter. Some \$6500 in sponsorship has been obtained for this meeting; some of this money will be used to support student attendance. Prof Bill Williams has agreed to give the after-dinner speech. The executive discussed making a presentation to Prof Williams and it was decided to leave this matter in the hands of the president and secretary.
2. **Report from M.Hart (via secretary):** At the end of March 1995 the society's general account contained \$13741.36. The ANZ trustee's account contained \$35064.72 at the beginning of January 1995. The society's books have been sent to the auditors. At the AGM in September the treasurer will present their report as well as an interim financial report covering the first nine months of this financial year. The treasurer will also distribute a new membership directory at the AGM. M.Brock suggested that such membership directories should appear yearly and that this was now possible given that all records are stored on computer files. The rest of the executive agreed with this initiative. The secretary will co-ordinate this matter with M.Hart and F.Sheldon (newsletter editor).
3. **FASTS and ASL:** As a new executive director has recently taken over the running of FASTS the president suggested that the society should again approach FASTS with the aim of asking for a meeting between it and the ASL. It was suggested that the ASL should invite the new executive director to the next ASL congress. If that failed, then the ASL should hold a teleconference with the director. M.Brock will write to FASTS with these suggestions.
4. **Biomaniipulation meeting:** LWRRDC has invited the ASL to organise such a meeting. M.Brock wrote to them about this matter earlier in the year. Since then three groups have offered to host this meeting: J.Davis after the Intecol wetlands conference in 1996; F.Sheldon after the ASL meeting in SA in 1996; CRC for Freshwater Ecology at the end of 1995. After some discussion it was suggested that S.Blanch (on behalf of the SA members) should liase with J.Davis and suggest that the preference of the ASL executive would be to link a biomanipulation meeting to an ASL meeting. LWRRDC would provide funds to run such a meeting.

5. **Intecol, Perth 1996:** This meeting on wetlands is being organised by J.Davis. A letter of support from the ASL has already been sent. It was agreed that the ASL would supply sticky address labels rather than a mailing list of ASL members to J.Davis.
6. **Wetland policy:** ANCA has established a wetlands unit. M.Brock will try to meet relevant ANCA personnel when in Canberra in early May to suggest that ASL be appointed to the National Wetlands Advisory Committee being set up by ANCA.
7. **Biodiversity Council:** P.Horwitz has offered to give a report on the current activities of the council at the next AGM.
8. **Australian Wetlands Alliance:** this group is organising a Ramsar meeting in Brisbane in 1996. M.Finlayson will represent the ASL.
9. **List of ASL spokespeople:** the executive agreed to identify likely people to send this list to by the end of May. Names will be sent to the secretary.

The next meeting of the executive will be held after a response has been received from FASTS.

ARTICLES

NATIONAL RIVER HEALTH PROGRAM -MONITORING RIVER HEALTH INITIATIVE-

The Monitoring River Health Initiative program is a component of the nationally coordinated National River Processes and Management Program (NRPMP), a collaborative Federal and States/Territories program. The centrepiece of MRHI is the development of a RIVPACS (River Invertebrate Prediction and Classification Scheme) approach for river bioassessment and monitoring. It is based on standardised rapid bioassessment protocols to obtain macroinvertebrate and key physico-chemical habitat variables from a network of relatively unimpacted (Reference) sites and impacted (Monitoring) sites. The data obtained from these sites will be used to construct models for assessing the health of rivers and the various impacts on them, and to monitor the progress of management actions. The final result should be a greatly enhanced decision support system for river managers and policy makers.

Western Australia

CALM: *Stuart Halse, Department of Conservation and Land Management, Science and Information Division, Wildlife Research Centre, Woddvale WA. Fax: (09) 306 1641; Phone (09) 405 5100*

The Western Australian Department of Conservation and Land Management (CALM) is the lead agency for the MRHI in Western Australia. Fieldwork and laboratory work is shared with three universities, although CALM is coordinating the project and analysing the data. We have 188 reference sites covering most of the State; 137 of the sites are located in south-western Australia, where most of the State's population is centred and ecological disturbance is greatest. The universities are responsible for sites in the south-west, CALM samples the sights in the northern part of the State. The specific areas covered by each agency and the people involved are: CALM (Stuart Halse, Mick Smith, Winston Kay) - Murchison, Gascoyne, Pilbara, Kimberley; Edith Cowan University (Pierre Horwitz, Kim Richardson) - Naturaliste Ridge, Blackwood River into Wheatbelt, South Coast east of Albany; Murdoch University (Jenny Davis, Phil Papas) - Jarraah Forest, Avon River into Wheatbelt, Coastal Plain on west coast between Busselton and Geraldton; The University of Western Australia (Don Edward, David Cale, Peter Davies) - Karri Forest, South Coast west of Albany.

The primary aim of the Western Australian project is to develop a predictive model of the occurrence of macroinvertebrate families in rivers and streams based on stream attributes. We expect to have to construct at least two models for the State, because of differences in fauna and stream types in the north and south of the State. Possibly, we will combine data from north-western Australia with that from the Northern Territory and Queensland to construct a single northern Australia model.

A secondary aim of the project is inventory - macroinvertebrate data will be gathered in a systematic way from most of the State, which will provide a lot of information on the occurrence and distribution of taxa to assist in planning for conservation and assessing the significance of impacts of proposed developments. Many Western Australian river systems have not previously been surveyed for macroinvertebrates.

We are live-picking samples in the field in the south-west but in northern areas, where minimising time in the field and the amount of equipment to be transported are important considerations, we are preserving samples to be sorted in the laboratory. We are comparing results from live-picking vs laboratory-sorting preserved samples for a small number of sites.

So far, we have completed two rounds of sampling all sites and have sorted, identified all animals to family and entered the results on database for the first round of sampling.

New South Wales

NSW EPA: *Russell Crowell, New South Wales EPA, Locked Bag 1502, Bankstown, NSW 2200. Phone (02) 795 5441, Fax (02) 795 5004, Email: OWELL.RUSSELL@epa.nsw.gov.au*

A Fact Sheet on the National River Health Program indicates that the program aims to standardise biological monitoring protocols throughout Australia. One major component is the development of a coordinated national river bioassessment and prediction scheme to improve the knowledge of the health of our rivers, of the impacts of pollution on ecosystems and the effectiveness and catchment management actions. This scheme has been conceived to be similar to the British RIVPACS approach and includes a network of relatively unimpacted reference river sites from which samples of macroinvertebrates will be collected for identification to the family level. The final product will be a model which predicts macroinvertebrate community assemblages based on observed environmental variables.

Implementation in New South Wales

An overall approach has been devised based around the division of the State into presumed eco-regions (groupings of naturally similar ecosystems which thereby stratify aquatic chemistry and biota into relatively similar areas). This selection of

regions was based on considerations of longitude (ie eastward or westward flowing), climate and geology. Seven regions have been identified:-

- North Coast
- Central Coast
- South Coast
- Alpine
- Northern Inland
- South West Inland
- Far North West

Several representative catchments from each region have been chosen and further subdivided on the basis of topography, vegetation, soils, stream size, etc. Sampling sites are being selected so as to represent each of these sub-regions within each catchment. Finding relatively unimpacted (reference) sites in some sub-regions within some catchments has proven very difficult and thus some compromises on the definition of 'relatively unimpacted' have had to be made. In this whole process, the guiding principle has been to select sampling sites from as many as possible of the combinations of environmental conditions which might reasonably be expected to have some influence on macroinvertebrate faunal populations. In this way, the model which is finally developed will have the maximum possible robustness and area of applicability. The Lead Agency for the MRHI in NSW is the Environment Protection Authority (EPA) with another seven agencies (most notably Department of Land and Water Conservation [formerly Department of Water Resources] and Australian Water Technologies [part of Sydney Water]) making significant contributions. The field data and sample collection techniques being used are essentially those specified in the River Bioassessment Manual.

Most effort hitherto has been directed into 2 areas:-

- Site selection - this is to ensure that as wide a range as possible of the different environmental variables is covered by the sites chosen with sufficient replication and representativeness to give confidence to the data collected;
- Field data collection - almost all field workers, including some from the contributing agencies, have been trained in the appropriate field techniques.

Logistic details have been arranged such that at least one member of every field team has been so trained.

Apart from the biological sampling techniques, this training has included the observing and correct recording of associated environmental data (eg geomorphology, botany, etc). In addition, the list of field parameters recorded has been expanded to permit greater robustness in the suite of environmental variables used in the model development.

AWT ENSIGHT Dr Bruce Chessman AWTEnsignt, PO Box A239, Sydney South 2000.
Phone: 02-334 4863, Fax: 02-261 3167.

Evaluation of Attached Diatoms for the Assessment of River Health

Project Team: Julie Currey, Nicola Plunkett-Cole and Bruce Chessman.

This project aims to develop a RIVPACS-type predictive model for benthic diatom communities in rivers and streams. In the spring of 1994 and again in the autumn of 1995, 137 least disturbed reference sites and 55 disturbed test sites were sampled in eastern NSW and Victoria. Sites were selected using topographic maps and in many cases corresponded to sites used for the State and Territory macroinvertebrate program. Diatom scrapings were obtained from rocks and other stable substrata such as wood and macrophytes. Five samples were taken at each site on each occasion, covering a range of current speeds and shaded and unshaded positions. Diatom cells in the samples are now being cleaned and mounted, prior to identification and the construction of predictive models.

Relating River Macroinvertebrates to Specific Changes in Water Quality

Project Team: Paul McEvoy and Bruce Chessman

The purpose of this project is to improve on the current version of the SIGNAL biotic index for Australian river macroinvertebrates, and to see whether different versions of the index can be developed for various types of river disturbance.

Three disturbances are being considered: metal contamination from historic mining, disposal of treated sewage effluent, and river regulation. Three rivers subjected to each type of disturbance are being sampled in summer-autumn and winter-spring, using the methods in the River Bioassessment Manual. The rivers extend from the River Dee in central Queensland to Yarowee Creek in western Victoria.

Within each river there are two undisturbed reference sites and three sites with varying levels of disturbance. The occurrence of families of macroinvertebrates will be correlated with the level of disturbance and the correlation will be used to assign disturbance-sensitivity grade numbers to each family for each form of disturbance. The grade numbers will be used in the calculation of the SIGNAL index.

Evaluation of Rapid Bioassessment for RIVPACS Modelling

Project Team: Rodney Hardwick, Cathy Cantwell, Adam Munn and Bruce Chessman

This project is testing aspects of the rapid macroinvertebrate assessment procedure specified in the River Bioassessment manual. Ten sites in eastern NSW in relatively undisturbed forest areas are being compared with matched sites in mildly disturbed agricultural areas. The ability of the rapid assessment sampling procedure to discriminate between these two types of sites is being compared with traditional quantitative sampling. The results of rapid assessment sampling when employed by experienced river biologists are being compared with rapid assessment by university students. Results to date support the validity of the methods in the River Bioassessment Manual.

A parallel study using sites in Victoria is being run by the Victorian Environment Protection Authority.

QUEENSLAND

QLD *Dr Satish Choy Monitoring River Health Initiative, Water Resources Technical Centre, 1345 Ipswich Rd, Rocklea, Qld 4106. Phone: 07-848 5193 Fax: 07-848 9627.*

The MRHI program in Queensland commenced in 1994 and is being managed by the Department of Primary Industries (DPI) in close collaboration with the Department of Environmental and Heritage (DEH). About 200 reference and 20 monitoring sites in 25 major catchments of the State have been selected for the monitoring program. The catchments include various rivers of concern for management and cover a wide range of climate, geologic and biogeographical regions, including those in Coastal, Central Arid, Wet Tropic, Gulf and Cape areas. Within each catchment sites were chosen on the basis of compliance with predetermined discriminators (eg. level of impact, representativeness and accessibility).

Sampling will be carried out over two years and the resulting data will be used to develop, test and evaluate the models. Sampling Protocol involves the standard 10 m kick sampling and hand picking live material for 30 minutes, as specified in the NRPMP/MRHI River Bioassessment Manual (1994). All biological samples collected are preserved and transported to a central laboratory for analysis. Water quality parameters and samples are collected, transported and analysed in accordance with the standard protocol.

All phyto-chemical and biological data will be entered into a database (possibly HYDSYS) in the DPI for storage and future processing. A voucher collection of biological specimens will be maintained in the central laboratory, some sent to taxonomists for QA/QC and the remainder of the preserved and labelled material will

be sent to the Australian Centre for Tropical Freshwater Research at James Cook University, Townsville for curation and archiving.

The first sampling, to coincide with the late dry season, was completed in November 1994 and taxonomic analysis is currently underway. The second sampling was carried out in May 1995, following the wet season.

A package of initiatives has been developed for communicating the Program for interest groups, government departments and river catchment management groups through DPI and DEH.

NORTHERN TERRITORY

NT Power and Water Authority: *Jane Suggit, Power and Water Authority, Water Resources Division, GPO Box 1096, Darwin NT 0801. Phone: 089-82 6451 Fax: 089-82 6450.*

Sample Sites

The Monitoring River Health Program in the Northern Territory samples 120 reference and monitoring sites across the 'Top End'. This covers 13 river basins in the humid and semi-arid climatic zones of northern NT. They are as follows: the Adelaide, Daly, Darwin region, East Alligator, Finnis, Goyder, Keep, McArthur, Mary, Melville Island, Roper, South Alligator and Victoria Basins. The river basins selected can be classified into one of the following 3 categories:

- Developing regions close to Darwin
- Distant basins likely to experience increased activity
- Distant basins largely under Aboriginal ownership

The range of reference sites cover upper, middle and lower reaches of the rivers selected. All of these reference sites can be categorised as near pristine or "least impacted". The types of monitoring sites chosen include river reaches in degraded pastoral areas, downstream of mining leases and urban creeks/rivers. Five sites were also chosen to be sampled in conjunction with sites already being studied for macroinvertebrates. On the South Alligator River 3 sites were matched with the Environmental Research Institute of the Supervising Scientist, and on the Finnis River 2 sites were matched with ANSTO.

Field Program

Field sampling runs are being conducted in early and late dry season i.e. 2 runs between May to December. Sampling commenced in mid October of 1994 (late dry season). The second run (early dry) commenced in May of this year and is in progress now.

The NT macroinvertebrate collection method involves the use of a rake to disturb the substrate in front of a 250µm net. This method is used when sampling silt/sand beds, gravel/rock beds and edge habitats (ie. two person operation). A secondary use of the rake while sampling is as a weapon for fending off crocodile attacks! As yet this secondary use has remained untested although the probability of encountering this hazard has increased due to the 1995 record wet season. Recently several salt water crocodiles have been trapped in the Katherine region (300 km inland).

MRH Displays

The NT MRH program has been associated with a number of organised displays for the general public. During National Water Week macroinvertebrates found in NT creeks and rivers were featured in a hands-on display. Classes from Darwin Primary Schools attended and went through a series of activities - water sampling, collection of macroinvertebrates, sorting to different orders and microscope demonstrations. A similar exercise was run at the Darwin Rural Show and will again be run at the 1995 Water Week activities.

NT Contacts

The majority of personnel involved with the MRH program are from the Water Resources Division of the Power and Water Authority. There is a core group of 4 people and always one if not two of the core group are present on each field trip. This core group is comprised of Rodney 'Rocket' Metcalfe, Jane 'Mad-Dog' Suggit, Armando "No-Flats" Padovan and Shane 'Croc bait' Griffiths. Contact phone numbers are (089) 826 404 or 826 451; Fax: 826 450.

SOUTH AUSTRALIA

SAEPA *Dr Phil Suter, South Australian EPA, GPO Box 2607, Adelaide SA 5001.
Phone: 08-204 2044, Fax: 08-204 2020.*

*Peter Goonan or Chris Madden, Australian Water Quality Centre,
Private Mail Bag, Salisbury SA 5108. Phone: 08-259 0336.*

The South Australian program samples 140 sites throughout South Australia (including one in Queensland on Cooper Creek). Thirty of these sites are at present designated as monitoring sites, affected by mine drainage, pesticides, reservoirs, flow management, winery waste, sewage treatment works and urban development. Most of the sites have been impacted to some extent by European settlement so the separation of reference and monitoring sites is based on identifiable localised inputs. The locations are spread over five drainage divisions; SA Gulf, Lake Eyre, Lake Frome, Murray-Darling and South-East Coast. Most sites are close to Adelaide and sampled on day trips. Sites in the Flinders Ranges, South-East, Kangaroo Island and Cooper Creek are sampled in blocks on two, three or four day expeditions. Some locations have been used in

previous or ongoing projects (e.g. Murray River, Sturt River, Dawesley Creek) but more than 100 have been sampled for the first time in this program.

Field sampling is conducted in autumn (April-June) and spring (October-November). Two people can visit all sites in less than 30 days of field work. The third survey has just been completed. Samples are preserved with formalin in the field and 10% sub-samples are counted in the laboratory. Processing of samples is a slow process and the second survey count is about half finished. Entry of biological and physical data from the first survey is virtually complete. So far approximately 350 taxa have been recorded from the 140 locations.

Most of the sampling and processing has been carried out by Peter Goonan and Chris Madden, based at the Australian Water Quality Centre (formerly State Water Laboratory) at Bolivar. Fran Sheldon has been part of the team since March, on a six-month contract, and has assisted with field and lab work and provided valuable expertise on databases. Phil Suter, as overseer, has visited most locations, helping out when EPA duties permit. Phil is also itching to get the complete first survey data and play with it.

VICTORIA

EPA Victoria *Leon Metzeling, Limnologist, Catchment and Marine Studies, Environment Protection Authority, Victoria. Phone: +61 3 628 5955; Fax: +61 3 614 3575*

There are five projects being undertaken in Victoria under the auspices of the MRHI. The Victorian EPA is designated as the lead agency, which means that the funds and some of the administrative side of things go through us while others, apart from us, do the work. The five projects and the groups doing them are as follows.

1. *Baseline biological assessment of water quality in Victorian streams* (the biggest project) - Victorian EPA and Water Ecoscience (formerly the State Water Laboratory)

There is a history of EPA biological monitoring in Victoria prior to the MRHI. In the last phase of that program, six river basins were sampled using techniques essentially the same as those specified for the national sampling protocol. These data are currently being used to build a successful RIVPACS model in a collaborative project between the CRC FE and EPA Victoria. Thanks to the MRHI all the remaining river basins will be sampled by autumn 1996 with the work being jointly carried out by EPA Victoria and Water Ecoscience. Both organisations are also bringing additional resources to the program either from internal sources or external funding bodies (NLP, regional water authorities etc).

Approx. 280 sites will or have been sampled, most of which are considered as "reference" sites (that is, minimally impacted), and these will be used to build the predictive model which is the main aim of the program. Separate kick sample and sweep samples are collected from each site, depending on habitat availability. Our sweep sample differs slightly from that specified in the National River Bioassessment Manual in that our sample comprises both the edge and macrophyte samples described in the Manual. This ensures consistency between the early and current phase of the monitoring program. All samples are sorted live in the field for 30 minutes and identified to species, if possible, in the laboratory.

Many people are involved in the program, either on a full or part time basis. At EPA this includes John Dean, Ros StClair, Rebecca Hewlett, Tim Bessel-Brown, David Bryant, David Tiller, Lisa Dixon and Leon Metzeling. At Water Ecoscience, the people involved are Rhonda Butcher, Danny Vertessy, Alastair Cameron, Kylie Lewin, Keith Ferdinands, Rhys Jones and Phil Mitchell.

As part of this program EPA has also sampled 48 sites in urban Melbourne. These are definitely not reference sites, most representing the other end of the scale. Data from these sites have been used to provide background information for the current review of the Yarra State Environment Protection Policy and aid in the development of ecological criteria for the policy.

2. Development of an Index of River Condition - Jane Doolan, Division of Water Resources, Department of Conservation and Natural Resources.

DCNR and EPA have contracted the Centre for Applied and Environmental Hydrology and Ian Drummond & Co to undertake a consultancy to develop the Index. The Index will have 5 separate components: biological, physical condition of bed and banks, water quality, riparian and hydrological. Each component is composed of a number of indicators. Each indicator is ranked on a 5 point scale and then aggregated to a score out of 10 for each of the 5 components. It is anticipated that the Index will provide a mechanism for benchmarking waterway condition, a basis for long term monitoring and management of rivers, a convenient and easily understood means of assessing the effectiveness of management strategies both within management agencies and for the reporting back to the community and Government.

3. Evaluation of artificial substrates sampling with the national sampling protocol - Nick Souter, Floodplain Ecology Group, DCNR.

One of the aims of this project is reflected in its title, the other aim being to compare sampling efficiencies of and calibrate the 2 methods thus enabling data from other monitoring programs (especially River Murray monitoring) to be effectively utilised. Sites have been selected in conjunction with biological monitoring sites in the Goulburn and Broken catchments. Three ASS were trialed at each site - flywire, citrus bags and orange bags providing the substrate

within the plastic mesh gutter guard with a half brick for ballast. This project will be completed in December 95.

4. *Taxonomy* - John Dean, Ros StClair, David Cartwright (Melbourne Water) and Phil Suter (South Australian EPA)

In Victoria, the taxonomy of aquatic stages of selected families of Australian Ephemeroptera and Trichoptera is being investigated by Ros St.Clair, John Dean and David Cartwright (Melbourne Water). The project is Australia-wide, and will primarily be based on material collected in all States during the MRHI study and material already held in Australian collections. The large number of undescribed species and the non association of immature stages with adults will be an impediment to formal taxonomic identifications, and for this reason the taxonomy will be based on material held in a National Voucher Collection which is being established in the Museum of Victoria. The study will generate fully illustrated keys to voucher species, and the data will be incorporated into a matrix which will be suitable for use in a computer based interactive key. Established voucher collections around Australia will be examined, and species designations will be rationalised.

5. *Evaluation of rapid biological assessment for RIVPACS modelling* - Victorian EPA and AWT Ensignt, Sydney.

This project has two aims: (a) to assess the effect of inter-operator sampling consistency (in particular, experienced vs novice) in rapid bioassessment incorporating field sorting, and (b) to compare the information derived from rapid bioassessment samples with that obtained from traditional quantitative sampling techniques. Eighteen sites have been sampled both in Victoria and New South Wales with half of the sites being subjected to disturbances ranging from mild to moderate. The types of disturbances included fish farms, small sewage treatment plants, dams, forestry and agriculture. In Victoria the work is being undertaken by Leon Metzeling and Vera Wong, in NSW by Bruce Chessman and Rod Hardwick.

Each site was sampled in the following way. Two experienced biologists and two novices with limited training sampled each of 3 habitats specified in the national sampling protocol- riffles, edges and pool rocks. These samples were live sorted in the field and the experienced and novice samplers identified their own samples to family in the lab. The experienced samplers also collected 4 quantitative samples from each of the 3 habitats using traditional techniques. The results to date for the Victorian data indicate that although the numbers of animals picked out differed between samplers, there was no difference in the number of taxa. Preliminary multivariate analyses show the samples from the 4 people are very similar and easily discriminate between unimpacted and impacted sites. Preliminary assessments of the identifications by the NSW novices have shown them to be reliable with a about a 12% error rate in correctly naming the taxa but generally identifying the correct number of taxa.

NATIONAL RIVER HEALTH PROGRAM -URBAN R&D SUB-PROGRAM-

The National River Health Program, under which swarms of biologists are sampling rivers all over the country, also includes a research and development sub-program on urban streams and estuaries. This urban component is being managed by UWRAA (Urban Waters Research Association of Australia) which is now constituted under the new WSAA (Water Services Association of Australia). Funding available is \$400,000 per annum for 3 years.

The program is in the early stages, with some work on development of research priorities done last year but little progress since then. I have just been appointed co-ordinator of the urban sub-program and will be working in conjunction with Peter Davies to get the research program up and running. At present we are still at the stage of developing the framework and research priorities for the program. When this is finalised there will be calls for expressions of interest in &/or commissioning of research projects.

The program will include streams and estuaries affected by runoff and discharges from urban areas, and the planned emphasis is on the development of procedures and methods for assessing the ecological health of such streams and estuaries. The main problem with using the RIVPACS approach in an urban situation is the difficulty of finding comparable unimpacted reference sites.

Please contact me if you have any comments or queries.

Dr Jean Jackson,
118 Wentworth St, South Hobart, Tas 7004.
Phone/Fax: 002-23 7133.

MURRAY-DARLING BASIN COMMISSION -SUSTAINABLE RIVERS PROGRAM-

Environmental Flows Decision Support System

The Murray-Darling Basin contains approximately 16000 km of river channel from which 10 700 GL of water are diverted annually. This has led to many of the rivers having markedly changed flow regimes and has resulted in calls for consideration of the flow regime requirements of the riverine environment. The issue of environmental flows is a high priority of the Murray-Darling Basin Commission which has implemented the Sustainable Rivers Program. This program has the objective "to develop tools to facilitate the objective determination of the environmental impacts of changes in flow regimes".

The majority of the Basin's rivers have detailed hydrologic models that are capable of predicting flow on a monthly or daily basis. These models can be adjusted to reflect changes to the riverine system, such as modified operating/diversion rules. The question is therefore how to translate the flows determined by these hydrologic models to a response in the riverine environment. Such a translation is essential if the environment is to be fairly represented in resource sharing negotiations. What is required is the ability to be able to show a definite benefit or cost to the environment for a given change in flow regime.

The environmental flows decision support system (EFDSS) is being developed to allow this analysis to be carried out. The key components to the model are the relationships between the flow regime and the riverine environment. A workshop was held to consider the feasibility of such a model (Canberra 19-20 June). The general conclusion was that such a model was feasible and that a case study should be carried out as soon as possible. This conclusion was further reinforced at the National River Health Program workshop (Cooma 22-23 June) where it was concluded that basic relationships between flow regime and the riverine environment existed. The workshop recommended that a high priority of the Sustainable Rivers Program should be to compile a report detailing all currently known relationships.

The future of the EFDSS project involves several components that will be run in parallel. These include: a consultancy to determine all of the available relationships between flow and ecological response. It is recognised that these relationships will be of varying quality and some may be qualitative rather than quantitative. While this is a limitation it will still provide managers with a great deal more information than they currently have and will be of considerable assistance in programs such as the Victorian Bulk Entitlements.

The development of a basic model suitable for use with case studies. The case studies will determine whether the project can deliver a useful product and what form of model is the most useful. The intention is for two case studies to be carried out reflecting a regulated and unregulated river reach.

the development of a river classification scheme. The objective is to classify the Basin's rivers so that similar reaches can be identified and thus simplify the transfer of ecology-flow regime relationships.

For further information on the EFDSS contact:

Dr Ben Dyer
Project Officer
Sustainable Rivers Project
Murray Darling Basin Commission,
GPO Box 409, Canberra, ACT 2601

Phone: (06) 279 0143
Fax: (06) 248 8053
Email: b.dyer@mdbc.gov.au

AUSTRALIAN HERITAGE COMMISSION -THE WILD RIVERS PROJECT-

Objectives

The project has three main objectives:

1. To identify Australia's wild rivers, in co-operation with state and territory governments and appropriate non- government bodies.
2. To increase public understanding and appreciation of the values of wild rivers.
3. To work towards the development of an agreed statement of management principles for wild rivers.

Several ASL members are involved in the project, including Trish Gerharty (Vic), Jim Puckridge (SA) and Leon Barmuta (Tas) on the consultative committee with Carol Kunert (Vic) being one of the main consultants for the project.

What is a wild river?

For this project, a wild river is defined as:

A channel, channel network, or a connected network of waterbodies, of natural origin and exhibiting overland flow (which can be perennial, intermittent or episodic) in which:

- the biological, hydrological and geomorphological processes associated with river flow
 - the biological, hydrological and geomorphological processes in those parts of the catchment with which the river is intimately linked,
- have not been significantly altered by modern or colonial society.

Current phases of the Wild Rivers Project

Currently, there are three concurrent and active phases of the project:

1. Identification of those Australian rivers that could be called Wild Rivers.

The method for this approach and the development of a national computerised data base is being undertaken by Henry Nix and the Steins at the Centre for Resource and Environmental Studies (CRES) at the Australian National University. This database uses information available at a national level such as topographic information and the location of settlements, roads, built up areas and various land uses such as grazing, mining and forestry.

This phase of the Wild Rivers Project has two parts; the first part will incorporate a national overview and the second part will provide state and territory information.

Part one, involves firstly grouping Australia's rivers (and their catchments) identified at a 1:250,000 scale on similar physical characteristics using terrain and climatic data using a digital elevation model (at 250m grid spacing). Some 20 groups have been developed to date.

After the rivers have been classified, they are given a "wildness index" based on naturalness of the flow regime (using indicators such as impoundments, levee banks and flow diversions); and catchment naturalness (using indicators such as settlements/structures, extractive industries, infrastructure, clearing, logging and grazing). At the national level, this information will be derived from the AUSLIG Topo 250K database and the National wilderness Inventory primary data base.

This will result in a rating of all rivers for their condition ranging from highly modified to near-pristine. Those rivers likely to have high values for wildness will then be identified, to be verified with more detailed state/territory data. Pilot studies are currently being run in Victoria, the Kimberley region and south east Queensland to test the method. It is expected that Part one will be completed by October 1995.

It must be emphasised that these approaches are breaking new ground at the national level, and require testing and refining as the project continues, with further testing at the state level in Part two of the Wild Rivers Project.

Part two, which will be start on completion of the national overview study, will use the more detailed information and data sets available at the state/territory level to further refine the selection of potential wild rivers.

2. Development of a set of nationally agreed management principles to protect the values of wild rivers.

This project, which is being undertaken by Carol Kunert Environmental Consultant and Context Pty Ltd, will look at the impacts on, and the management of Wild River values overseas and in Australia and develop a discussion paper by July 1995 for public comment, covering principles and a code for wild river management. It will also present options for the adoption of these guidelines by land managers and decision makers.

To ensure that the recommendations of the report are practical and implementable, an understanding of state/territory methods and structures for river management will be gained through discussion with the relevant departments and interested parties.

3. Discussion with groups and individuals Australia-wide about the project.

In order to tell people about the project as it is developing, and to gain their views and suggestions, meetings with nominated stakeholders are being held during

March and April 1995. This phase of the project is being undertaken by Carol Kunert Environmental Consultant and Context Pty Ltd.

4. A communications and consultation strategy.

A broad ranging series of activities will inform and encourage people's involvement throughout the project. Activities include posters and videos about Wild Rivers, a photographic competition, a Wild Rivers handbook, workshops and conferences.

For further details about the Australian Heritage Commission and the Wild Rivers Project, call Brian Prince on 06 271 2174

To talk about the management guidelines contact Carol Kunert at the address below.

Information Wanted.

I am particularly interested in finding recent or current studies and research that may examine impacts on wild/pristine/natural river values or that may have implications for their management.

If you can assist please contact me:

Carol Kunert

ph and fax (03) 383 2625 or email ckunert@peg.apc.org

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CO-OPERATIVE RESEARCH CENTRE -WATER QUALITY AND TREATMENT-

A Co-operative Research Centre (CRC) for Water Quality and Treatment will be established in July 1995 which, with the CRCs for Freshwater Ecology, Catchment Hydrology and Waste Management and Pollution Control will complete the picture for water related research in Australia.

The CRC will be based at the Australian Water Quality Centre under the directorship of Don Bursill of the South Australian Water Corporation.

The research partners include the Australian Water Quality Centre, CSIRO Division of Chemicals and Polymers, AWT EnSight, CMPS&F Environmental, the Royal Melbourne Institute of Technology and the Universities of Monash, Adelaide, South Australia and Australian National.

The industrial partners are the major water authorities (South Australian Water Corporation, Australian Capital Territories Electricity and Water, Melbourne Water, Western Australian Water Authority), the Urban Water Research Association of Australia, ICI Watercare Australian Water Services and Thames Water.

The success of the application is a tribute to the strength of the team assembled in the CRC and a reflection of the importance of water quality and treatment issues to the Australian water industry.

The CRC will provide a comprehensive approach to water quality problems covering catchments, source waters, water treatment and the distributions systems. Particular attention will be paid to assessing health risks to consumers and to the development of the most cost effective methods for the reduction of those risks.

The research of most interest to limnologists is the catchment and source waters program which includes organic carbon loading, pathogens such as *Cryptosporidium* and toxic cyanobacteria.

The cyanobacterial research will include :

- Development of analytical methods for the detection of toxins.
- Health risk assessment from exposure to cyanobacteria.
- Flow manipulation for controlling blooms in rivers.
- Mixing and destratification of storages.
- Removal of toxins and tastes and odours by water treatment.

There will be considerable interaction between this program and the research at the other water related CRCs especially the CRCs For Freshwater Ecology, Soil and Land Management and Catchment Hydrology.

CALL FOR JOLLY AWARD NOMINATIONS

The Jolly Award commemorates Hiliary Jolly, a founding member of the Australian Society for Limnology, and is presented to a person who in the opinion of the Society, has made an outstanding contribution to Australian Limnology. The Jolly Award has become the Society's most prestigious prize, considered by members to indicate overall scientific excellence and outstanding achievement.

Any person may be nominated for the Award, but nominations may only be made by financial members of the Society. The nomination must be in writing and must be seconded by a financial member of the Society. Nominations must include a brief supporting statement and a current copy of the nominee's CV. Nominations remain valid for 3 years. An award is not necessarily made each year.

The full regulations governing the award are outlined below.

Nominations are now called for 1995 and should be forwarded, by 31st August 1995, to Dr Keith Walker, Department of Zoology, University of Adelaide, Adelaide SA 5005.

JOLLY AWARD REGULATIONS

The following guidelines have been developed with a view to maintaining the stature of the Jolly Award.

Regulations concerning the structure and functioning of the Jolly Award Committee.

Membership and meeting of the Jolly Award Committee

1. The committee shall consist of the three most recent recipients of the Jolly Award. If this is not possible then past recipients, chosen in chronological order, will be added to the committee until it comprises three members.
2. The constituted committee should discuss the award, preferably together at a meeting or by telephone. If this is not possible, for example if a member of the committee is absent from the country for an extended period, then that member should be replaced as described in Point 1. The committee may seek the opinion of the absent member by post or fax.
3. The committee's chairman will be the most recent recipient of the award and he/she will be responsible for organising the call for nominations, circulating nominations and arranging suitable meetings for the selection process. The secretary of the Australian Society for Limnology will maintain records and assist the chairman as required, but will not have voting rights.
4. The decision to make the award must be unanimous, except if a nominee has been promoted to go forward by two members of the committee, during two consecutive annual rounds of

selections. In this case the President and Vice-president of the Society will be asked to join the committee and an award can be made on a majority decision. If an award is not made then the situation will revert to normal for the following year.

5. A committee member may not vote on a nominee who works in the same department or shares research projects. If it becomes apparent that such a conflict of interests may occur, then the committee member should be replaced as described in Point 1.

Nominations

1. Any person may be nominated for the Jolly Award.
2. Only financial members of the ASL may nominate a person for the award. The nomination must be in writing and must be seconded by a financial member of the Society. Nominations must include a brief supporting statement and a current copy of the nominee's CV.
3. Nominations will remain valid for three years, after which a person can be renominated as in Point 2.
4. A Society member may be the primary nominee for only one candidate.

Selection Criteria

1. The Jolly Award is not an annual award, but is made on the basis of an outstanding contribution to Australian limnology. The selection committee should ensure that the stature of a successful candidate is commensurate with that of previous recipients.
2. A primary consideration is excellence in the field of limnological research, as demonstrated by key research papers and scientific publications.
3. Consideration should also be given to candidates who have played a major role in the advancement and dissemination of limnological knowledge, particularly where this enhances the information available on Australian aquatic systems.
4. The Award is not intended for administrative excellence or for service to ASL. These are more appropriately recognised by other awards, such as life membership of the Society.

Citation

The announcement of an award will be made at the annual conference and will appear in the Society's Newsletter accompanied by a citation describing the reasons for the award.

Award Value

The nature and value of the award will be determined by the Executive Committee of the Society.

Dr Rod Oliver
(ASL President 1989/90).

ANNOUNCEMENTS

THE ONASSIS PRIZE FOR THE ENVIRONMENT

The Onassis International Prize, the Delphi "Man and his Environment" Prize for 1995 was awarded to **Professor Jörg Imberger** of the University of Western Australia and **Professor Panayotis Varotsos** of the Athens University.

Professor Jörg Imberger, Chairman of the Centre for Water Research at The University of Western Australia and 1992 ASL Jolly Award winner, is the first Australian to receive this award. Professor Imberger is considered internationally as an authority in the field of Environmental Fluid Dynamics. His research has provided engineering tools for the management of coastal waters, the design of reservoir management technology and a program in environmental engineering focussing on natural systems.

Previous recipients include Greenpeace International, the Prime Minister of Norway Gro Harlem Brundtland, and Maurice Strong, the Secretary General of the 1992 Rio de Janeiro and 1993 Canadian United Nations Conference on Environment and Development.

AUSTRALIAN REPRESENTATION ON INTERNATIONAL COMMITTEES

Emeritus Professor Bill (W.D.) Williams has recently been elected to the position of Vice Chairman of ILEC (International Lake Environment Committee) Scientific Committee.

Additionally, at the SIL conference in Brazil, he was appointed editor of the *Verhandlungen Internat. Verein. Limnol.* Of other international involvements, he was appointed to an advisory committee of the Freshwater unit of UNEP and a species survival committee of IUCN.

At the national level, he has been invited by Senator Faulkner to join the National Wetlands Advisory Committee (and accepted) and to speak at a symposium on 'Environmental aspects of urban drainage' (August, Sydney).

Bill has also been elected a Foreign Fellow of the Russian Academy of Natural Sciences. *Apparently because of his abilities to hold a significant amount of Vodka without apparent influence (at least immediately).*

ENVIRONMENTAL RESOURCES INFORMATION NETWORK (ERIN)

The information on ERIN and EOS comes from "Biolinks" Issue No. 8 March 1995, published by the Biodiversity Unit, DEST, GPO Box 787, Canberra ACT 2601. Phone (008) 803 772.

The Environmental Resources Information Network (ERIN), established in 1989, aims to provide geographically-related environmental information required for planning and decision making. The ERIN databases store information about the environment - ranging from endangered species to drought and pollution. ERIN's new On-line Service, EOS, provides decision makers with access to this vast reservoir of information, and the analytical tools to interpret it.

The launch of EOS comes in the wake of the release of The Networked Nation - a major report by the Australian Science and Technology Council, which examines Australia's options for a networked future.

Information is available through EOS on:

- land management;
- plant and animal species;
- marine environments;
- environmental protection;
- international treaties, legislation and conventions;
- data sets and data standards;
- government programs; and
- contact.

For further information contact

Wayne Slater

Director, ERIN

GPO Box 787, Canberra, ACT 2601

Phone: 06-274 1111, Fax: 06-274 1333

Email: wayne@erin.gov.au

UWA EXPERTISE WINS CONTRACTS

The Centre for Water Research at the University of Western Australia has recently won two tenders to solve water quality problems with engineering solutions. Over the past five years the Centre has been concentrating on developing quantitative tools for water quality prediction. So it is well positioned to take advantage of the increasing reliance on the use of numerical models in the management of reservoirs.

The Centre and Australia's largest environmental engineering consulting firm, Sinclair Knight Merz, had a joint proposal to solve water quality problems in South East Queensland's North Pine Dam accepted.

The tender is to model water quality and implement destratification in the dam which has been experiencing poor water quality. Attempts to destratify it in the past were discontinued and previous modelling did not provide required management guidance. However, the South East Queensland Water Board is confident the Centre and Sinclair Knight Merz have the skills, limnological experience, models and engineering to achieve success this time.

Sinclair Knight Mertz and the Centre have a very tight schedule to work and an efficient destratification system will be operating in October. The reason for this deadline is to prevent another bloom occurring in summer. A bubble plume aerator will be used to destratify or mix the dam. The aerator introduces a stream of air bubbles at the bottom of the reservoir. These rise, causing the colder bottom water with low oxygen levels to move upwards to mix with warmer, better quality layers.

The team will use water quality equipment developed at the Centre, including the Thermister Chains. The process-based one-dimensional hydrodynamic model, DYRESM, will be applied to the reservoir and coupled with algorithms for phytoplankton production, oxygen dynamics, nutrient cycling and metal transformations (DYRESM-WQ). The program will be modified to meet North Pine Dam's specific requirements and a bubbler designed for its unique conditions.

Several of the Centre's staff will be involved - Dr John Patterson will oversee the DYRESM-WQ modelling. Professor Jörg Imberger will provide destratification design and review the water quality modelling. Dr David Hamilton will be available for peer review as part of the quality assurance system.. Calvin Gomez will undertake simulations under John and Jörg's direction.

Sinclair Knight Merz staff on both sides of the continent will be involved. Peter Farrell will join Jörg in heading the Perth team while environmental scientist Tim Wrigley of Sinclair Knight Merz's Brisbane office will bring local knowledge to the project. Tim was project manager for a similar DYRESM-WQ study at Lake Julius, Mt Isa. Project Director Norm Case, a civil engineer, will coordinate the destratification installation.

Sinclair Knight Merz, which is Australia's largest engineering firm, will use Brisbane electrical and mechanical engineering staff to co-ordinate electrical supply, switchgear and the mechanical installations.

A second success story is the Sydney Water Board's acceptance of a proposal from one of the units of the Centre for Water Research, the Centre for Environmental Fluid Dynamics, to develop, calibrate and apply a three-dimensional water and hydraulic model of the Lake Burrorang system.

The model will assess a range of processes under varying circumstances and will be applicable to other reservoirs of concern to Sydney Water Corporation Limited. The 3D model will be used to upgrade the existing 1D DYRESM-WQ model, thus enabling long term simulations to be made and a range of management strategies to be investigated. Among the conditions that will be investigated are drought and floods while management strategies must take into consideration water quality for both drinking and riparian purposes.

For more information contact:

Diana Frylink Phone: 09-380 2577, Fax: 09-380 1015

Caroline Wood Phone: 09-380 2466.

Centre for Water Research, The University of Western Australia, Nedlands, WA 6007.

UNDERSTANDING THE ECOLOGY OF AUSTRALIAN RUNNING WATERS

Understanding the ecology of Australian running waters: an assessment of current endeavours and of future priorities. by P.S. Lake. LWRRDC Occasional Paper Series 13/94.

This report, published recently by LWRRDC, has two objectives:

- Review and identify gaps in our knowledge of stream and floodplain ecological processes that prevent development of objective management criteria.
- Recommend and prioritise research and development to fill the gaps in our knowledge of in-stream and floodplain ecological processes, as a basis for management and monitoring of Australian rivers.

The report uses a blend of recent reviews and primary papers to evaluate the current state of knowledge of ecological processes in Australian rivers.

A must for all researchers of rivers and streams in Australia!!

FRESHWATER MACROINVERTEBRATE COLLECTION

Australian Water Technologies presently has a voucher collection of approximately 800 taxa of aquatic macroinvertebrates including insects, crustaceans, mites and oligochaetes, which have been collected from rivers and wetlands in coastal NSW. The collection is continually growing and is one of the largest collections of its type in Australia.

Some groups of specimens have been referred to taxonomists and we are keen to encourage the use of the collection for further taxonomic and biogeographical studies. We would be pleased to hear from researchers conducting such studies who would be interested in examining and/or naming specimens.

For further details contact:

Dr Bruce Chessman, Ph. (02) 334 0863
Fax (02) 334 0700 or

Dr Jane Growns, Ph. (02) 334 0709
email grownsj@styx.awtensight.nsw.gov.au

BLATANT CHIRONOMID BOOK ADVERTISING

"Chironomids - from genes to ecosystems" - the book of the 12th International Chironomidae meeting (Canberra, 1994) is now published (June, 1995) by CSIRO. It is available from CSIRO Publications, PO Box 89, East Melbourne, Victoria 3002, Australia for \$120. A limited number of discounted copies are available to individuals (not libraries) from the editor, petercr@ento.csiro.au for \$66 including postage.

The book opens with a plenary review sponsored by LWRRDC, of "The indicator concept in freshwater biomonitoring" by Rich Johnson (Swedish EPA). The remainder is divided into seven parts: Genetics of Chironomidae; Environmentally-induced developmental abnormalities; Chironomidae in Biological Monitoring; Austral chironomid studies; Chironomidae and humans; Ecology and behaviour; Chironomid morphology and systematics.

The meeting emphasised austral chironomid studies, with the following papers by Australian authors:

- V. Pettigrove, W. Korth, M. Thomas and K.H. Bowmer - 'The impact of pesticides used in rice agriculture on larval chironomid morphology'
- C.P. Madden, A.D. Austin and P.J. Suter - 'Pollution Monitoring Using Chironomid Larvae: What is a Deformity?'
- Geoffrey M. Clarke, Angela H. Arthington and Bradley J. Pusey - 'Fluctuating Asymmetry of Chironomid Larvae as an Indicator of Pesticide Contamination in Freshwater Environments'
- Rod A. Hardwick, Ian A. Wright, Hugh A. Jones, Bruce C. Chessman and David E. Holleley - 'Rapid Biological Assessment of Streams in the Blue Mountains, Australia: Characteristics of the Chironomidae (Diptera) Fauna'
- Mick Smith and Peter S. Cranston - '"Recovery" of an acid mine-waste impacted tropical stream - the chironomid story'
- P.J.Suter, P.M.Goonan, J.A.Beer and T.B.Thompson - 'The response of Chironomid Populations to Flooding and Drying in Flood Plain Wetlands of the Lower River Murray in South Australia'
- T. J. Hillman and D. L. Nielsen - 'Chironomid assemblages of temporal and permanent water bodies in an Australian floodplain forest'
- E.S.G. Schreiber - 'Stream drift of Chironomidae: Diel and seasonal patterns in the Acheron River, Victoria, Australia'
- Peter Cranston and Roger Kitching - 'The Chironomidae of Austro-oriental phytotelmata (plant-held waters): *Richea pandaniformis* Hook.f.'
- M.M. Stevens - 'Biology and control of *Chironomus tepperi* Skuse, a pest of rice in New South Wales'
- I.K.G. Boothroyd and Peter Cranston - 'Two Orthocladiinae (Chironomidae) genera common to New Zealand and Australia: *Pirara* n. gen. and *Eukiefferiella* Thienemann'
- Z.Z.Chen, S.A.Fabb, Jon Martin and B.T.O.Lee - 'Comparison of a Gene for a Possible Sex-influenced Protein in *Chironomus* and *Kiefferulus*'
- Jon Martin - 'A Mutation in *Chironomus tentans* Fab. that leads to Gynandromorph and Mosaic Formation'

NEWS FROM FASTS

FASTS launches Science Policy

'A science policy for the 21st century' was launched by FASTS at Parliament House on 8 June. The document was formally presented to Senator Chris Schacht (standing in for Senator Peter Cook, Minister for Industry, Science and Technology who was unavoidably detained by the Qantas debate taking place in the Senate) by the President of FASTS, Professor Graham Johnston. The policy document is a move by FASTS to a more proactive role in the development of science and technology policy in Australia, in addition to lobbying government on behalf of Australian scientists and technologists. FASTS views this document as a stage in the continuous process of developing their science and technology policy which will evolve with community needs.

The document covers Education, Industry, Government Institutions and National Facilities, and University Research and Research Training. It is based on discussions at the November 1993 and 1994 FASTS Policy Forums and input from the scientific community and other interested parties. FASTS regard the ideas the Statement contains as being particularly important in the lead up to the Government's Innovation Statement to be presented in September 1995. Senator Schacht in his speech noted that Senator Cook was disappointed that there weren't more submissions from scientists for the Innovation Statement, with most coming from industry.

At the launch, FASTS President, Professor Graham Johnston noted some of FASTS achievements, noting that Federal Science Budgets since 1984 had not received significant cuts. FASTS was formed in late 1985, in response to the substantial cuts to the 1984 Science Budget. Its formation followed Barry Jones' famous accusation that the S&T community was wimpish in its lobbying and did not provide him with sufficient muscle in his dealings with Cabinet.

Other FASTS achievements include:

- significant contributions to changing the climate of opinion about the importance of S&T
- lobbied to support the 150% tax incentive for R&D
- adoption of a comprehensive S&T policy by the ACTU
- lobbied for the development of the CRC scheme
- significant contributions to the National Curriculum Scheme
- lobbied for the Minister for Science to be in Cabinet
- worked to improve the number and size of ARC post-graduate awards
- lobbied for the continuation of the Factor (f) scheme for the pharmaceutical industry.

At the launch I caught up with Jason Middleton, currently the Marine Sciences representative on the FASTS Board. He agreed to come and talk about FASTS at our September AGM. We also discussed developing an aquatic and marine sciences policy for FASTS. This task should preferably involve as many of the FASTS member societies in this subject area as possible. Interested ASL members could investigate the possibility of establishing a working group, perhaps an electronic discussion group, to develop some ASL ideas.

The FASTS document is available from:

Toss Gasgoigne,
Executive Director
FASTS,
PO Box 218
Deakin West ACT 2601.
Phone (06) 282 2026
Email: fasts@anu.edu.au

It will be available on the World Wide Web by the end of July.

CONFERENCE REPORTS

NABS 1995

From: Ian Campbell (Ian.Campbell@sci.monash.edu.au)

The 43rd Annual meeting of the North American Benthological Society was held from the 30th of May to the 2nd of June at Keystone, a ski resort about 100km west of Denver Colorado. Although it was ostensibly summer the 600 odd (!) participants were greeted by snow showers and below freezing temperatures, and several Australians were heard to lament the fact that they had neglected to bring their winter shorts.

The conference is becoming increasingly internationalised, and in addition to the usual strong contingents from Australia (7) and New Zealand (there to gloat over the Americas cup), Europeans were also numerous, notably Swiss workers from EAWAG presumably partly in response to the recent appointment of James Ward as their director.

Prior to the meeting proper 3 one day technical workshops were held : on the use of benthic ecology to assess sediment contamination, the use of benthos in instream flow assessments and teaching ("how to cope with large, unprepared, or otherwise frustrating classes"). On the Tuesday evening the conference opened with the presidential address by Fred Benfield and a presentation by the award of excellence recipient Rosemary Mackay. Rosemary spoke on her experiences as the editor of JNABS, discussing the factors that contribute to a successful paper.

With such a large, and diverse, conference it is difficult to identify important themes. Special sessions were held on landscape influences on watersheds, dissolved organic matter in suspension in lotic systems, microbial ecology of streams, testing the influence of environmental heterogeneity on streams, and invertebrate communities in southern hemisphere streams.

For breadth and quality of presentations, and the number of stream ecologists who attend, the NABS meetings are the premier international meetings for stream ecologists. Those outside North America can play an important role in counteracting the view that a paradigm in stream ecology can be developed based solely on data from Michigan and Ontario. For example "One of the most important influences on small streams at the reach scale is beaver activity", but if "beaver" is replaced by "platypus" there is a tendency for the audience to view you as excessively provincial.

The final notable feature of the conference was the fun run which was still held even at an altitude of 9500 ft (which is still high even if you convert it to metres) - one Australian was even silly enough to participate in it. No names - but it wasn't Stuart Bunn (who said it would cut into his drinking time too much) or Peter Davies (who'd forgotten his running thongs).

NZ WORKSHOP

“CARBON SPIRALLING IN STREAMS: THE BASIS FOR STREAM RESTORATION”

From: Andrew Boulton (aboulton@metz.une.edu.au)

In March-April, 1995, Drs John Quinn, Chris Hickey and Bryce Cooper of the National Institute for Water and Atmospheric Research (NIWA) in New Zealand hosted a six-week workshop in Hamilton attended by scientists from the United States, Australia and New Zealand. US participants were Stuart Findlay, Don DeAngelis and Rick Edwards who contributed expertise in aquatic ecosystem modelling, microbial dynamics, subsurface water flow paths and community processes, and other processes relevant to riparian and catchment restoration. Despite the insensitivity of the New Zealanders to Australian efforts in the America's Cup, Stuart Bunn provided some advice on isotope work, skilled pointing, car-key abuse and demonstrated methods for rapidly entering incised stream channels using an electric fence. Andrew Boulton introduced NIWA to some cheap methods for studying stream subsurface processes and leaf litter breakdown and did not threaten the local salmon population at all. There were also several workshops aimed at producing a model of carbon spiralling in New Zealand streams.

Carbon spiralling refers to the manner in which carbon is introduced into a stream ecosystem (by subsurface or overland flow or leaf litter input) and is then transported downstream while undergoing chemical transformations and biological uptake and release by microbes, plants and stream fauna. Substantial changes to river ecosystems are wrought by catchment clearance, revegetation by exotic trees or pasture, and introduction of herbivores like cattle and sheep. Stream restoration must identify how these activities influence the natural processes of the stream ecosystem, and the most efficient and economical ways of repairing the damage. For example, land-care groups seeking to replant river banks need to know which species to plant, where to plant them and what changes to stream and catchment use are viable and socially acceptable to maintain growth of stream-bank vegetation.

NIWA has an international reputation for interdisciplinary research in marine and aquatic ecosystems. An ambitious project studying the ecosystem processes within a number of streams with different land uses at the Whatawhata Agricultural Research Centre near Hamilton commenced in 1992, and long-term monitoring, based on recommendations from this workshop, is expected to continue. At Whatawhata, permanent sampling sites and gauging stations lie on streams draining exotic pine forest, pasture, a mix of native forest and pasture and pure native forest. These different land uses have altered the way carbon is spiralling through the streams and experimental manipulations are planned to restore some of the pasture sites to conditions close to those in native forest streams. Such experiments are long-term (>5 years) and results will prove of great interest to catchment managers.

Sampling of hyporheic zones of five streams draining catchments with different land uses led to the following hypotheses that will be examined further by scientists from NIWA. The clearing of native forest along the streams promotes hill-side slumping in these steep catchments, producing immense amounts of inorganic silt and smothering lateral gravel bars along the edges of the streams. The silt blanket impedes exchange of surface and subsurface water, leading to conditions of low oxygen within the streambed. This alters the rate of microbial transformation of DOC, and markedly reduces subsurface invertebrate abundance and biodiversity. The gravel bars that may act like the “biological filters” of gravel in a fish tank are thus isolated from the streamwater, and nutrient levels rise accordingly, promoting algal growth in the unshaded pasture streams. These algae trap further silt, aggravating the problem.

The restoration solution is not clear. Efforts to flush the sediments and clear the interstitial spaces may lead to further erosion of the stream channel in the short term. Flash flooding typically occurs in these streams and as the native vegetation is not there to act as a sponge, runoff is swift and erosive. It appears that a vital first step is revegetation to stabilise the banks and slow rates of hill slope slump. One of the key aspects of this workshop was the identification of the importance of processes in the subsurface compartment of the stream to the “healthy” functioning of the stream ecosystem and the need to restore exchange of surface and subsurface water to help recover the system to that typical of native forest.

The workshop organised by NIWA highlighted the importance of NZ limnology to Australian limnologists - we are tackling many of the same problems and the coordinated approach by NIWA coupled with long-term ecological projects appears to be extremely successful. New Zealand is not that far away from Australia, and the warmth of the hospitality offered by NIWA is a good indicator of the enthusiasm NZ limnologists have towards sharing ideas and data. Just make sure you look out for judder bars, that the chilly bin is always full, and that you jandals are double-pluggers.

CONFERENCE CAPERS

AUSTRALIA 1995

- **Australian Society for Limnology**, 17 to 20 September 1995, Jenolan Caves, Blue Mountains, New South Wales. See inserted leaflet and information in this Newsletter for details.
- **Nutrient Determination in Freshwaters**, 29 November to 1 December 1995, The Convention Centre, Charles Sturt University, Wagga Wagga, NSW. The conference is being conducted by the Environmental and Analytical Laboratories at Charles Sturt University in conjunction with the Murrumbidgee Water Action Plan. The conference is aimed at persons involved in the measurement and interpretation of data on nutrients in freshwaters. Submission of Abstracts deadline is 14 June 1995 and Registration deadline 30 October. For more information contact Kirsty Blair Phone 069-33 2849, Fax 069-33 2477, Email shelliwell@csu.edu.au.
- **The XIIth Australasian Society for Phycology and Aquatic Botany**, 7-9th July 1995, Anchorage Village Resort, Stradbroke Island, Brisbane. Closing date for Abstracts is 1st May 1995. Further details from Frances D'Souza - Ph (07) 286 8270, email: frances.dsouza@qld.ml.csiro.au OR Michele Burford - Ph (07) 286 8236, email: michele.burford@qld.ml.csiro.au. Fax: (07) 286 2582. Sessions on: biotechnology, taxonomy, impacts of nutrients, primary production, reproduction, trophic dynamics, ecology, physiology and toxicology.
- **Symposium on Spatial and Temporal Scaling of Ecological Processes in Freshwater Systems**. From 6 December - 8 December 1995. The Symposium is sponsored by the CRC for Freshwater Ecology and will be held at the CRC for Freshwater Ecology, Monash University. All enquiries to Dr Gerry Quinn, Dept. Ecology & Evolutionary Biology, Monash University. Phone: 03-9055633 Email: Gerry.Quinn@sci.monash.edu.au (*see section in Announcements*).
- **MODSIM 95, Congress of the Modelling and Simulation Society of Australia**, 27-30th November, University of Newcastle NSW. Information from the International Congress Secretariat: Dr Philip Binning, Dept. of Civil Engineering and Surveying, University of Newcastle, NSW 2308, Australia. email: modsim95@newcastle.edu.au
- **Ecology Society of Australia**, 27 - 29 September, 1995, University of Tasmania, Hobart, Tas. There will be both Symposia and Open Forum sessions over three days. Deadlines for Abstracts is 30 June 1995. General registration and Abstract forms from Kerrie Green, Dept. Geography and Environmental Studies, University

of Tasmania, GPO Box 252C, Hobart. Tas 7001. Ph 002-202840. Fax: 002-202989.

- **Wetlands for Water Quality Control**, 25 - 29 September 1995, James Cook University, Townsville. Deadline for Abstracts was 10 February 1995, all correspondence to Conference Secretariat, c/- WITA (Qld) Inc, PO Box 209, Albert St, Brisbane Qld 4002. Phone: 07-2242647, Fax: 07-2247999.
- **ANZAAS '95 Congress**, 24-27 September 1995, Newcastle City Hall Convention Centre. Abstract deadline was 24th June 1995, for further information contact Conference Secretariat, ANZAAS Congress 1995, c/o Newcastle Visitor and Convention Bureau, PO Box 489, Newcastle NSW 2300. Phone: 049-299434, Fax: 049-295948.
- **The Literature of Australian Natural History**, 8 December 1995, University College, Australian Defence Force Academy. This is a seminar about the writers and writing on the animals and plants of Australia. Enquiries to Nick Drayson, English Department, University College, Australian Defence Force Academy, Canberra ACT 2600. Phone: 06-268 8433, Fax: 06-268 8899, Email: nick-drayson@adfa.oz.au.

OVERSEAS 1995

- **Global Changes and Geography: summit conference of the International Geographical Union**, Moscow, 14-18 August, 1995. Information: Prof V. Kotlyakov, Institute of Geography, Russian Academy of Sciences, Moscow 109017, Russia. Fax: 7-095-230 20 90.
- **Vth International Congress of Systematics and Evolutionary Biology**, Budapest, Hungary, 18-24 August, 1995. Information: G. Vida, Növényrendszertani és Ökologia Tanszék, Eötvös Loránd Tudományegyetem, Kun Béla tér 2, 1083 Budapest, Hungary.
- **8th International Conference on Ephemeroptera & 12th International Symposia on Plecoptera** to be held at Château d'Ex, in the Swiss Alps between Lausanne and Frigour. There will be a mayfly conference on 14-17th August, a joint mayfly-stonefly symposium on 18th August and the stonefly symposium from 19-20th August. For further information contact Mayfly-Stonefly Congress, Museum of Zoology, PO Box 448, CH-1000 Lausanne 17, Switzerland. Ph 41-21 312 83 36; Fax 41-21 323 68 40.
- **Entomological Society of America** (systematics, morphology, evolution), 17-21 December 1995, Las Vegas, USA. Information from Richard Brown, email: moth@ra.msstate.edu.

- **6th International Conference on the Conservation and Management of Lakes**, 23 to 27 October 1995, Kasumigaura, Japan. Early registration closes 30 June 1995. Information from the Secretariat of the 6th International Conference on the Conservation and Management of Lakes, 1-5-38, Sannomaru, Mito, Ibaraki 310 Japan. Phone: +81-292-24-6905 or Fax: +81-292-33-2351.
- **New Concepts in Stream Ecology: An Integrative Approach**, 28 August to 1 September 1995, University of Georgia, Savannah River Ecology Laboratory, Aiken, South Carolina, USA. Audience membership is limited to 60 people. Information from Ms Felicia Munson, Fax: USA (803)725-3309 or email: munson@srel.edu
- **The Conservation and Management of Freshwater Mussels II: Initiatives for the Future**, 16 to 18 October 1995, Embassy Suites Hotel, St Louis, Missouri USA. Information from Kurte Welke, Wisconsin Department of Natural Resources, 111 West Dunn Street, Prairie du Chien, WI 53821 USA. Phone: (608) 326-0233.
- **Aquatic Ecosystems Stewardship**, North American Lake Management Society 15th International Symposium, 6 to 11 November 1995. Information from Dr Neil Hutchinson, Ontario Ministry of Environment and Energy, Dorset Research Centre, PO Box 39, Bellwood Acres Road, Dorset, Ontario Canada P0A 1E0. Fax: (705) 766-2254.
- **Conservation and Fresh Water: Linking Science with Policy**, The British Council Seminars in Scotland, 7 to 14 September 1995, Stirling Scotland. Further information from the International Seminars Department, The British Council, 10 Spring Gardens, London SW1A 2BN, UK. Phone: +44 (0) 171 3894264, Fax: +44 (0) 171 389 4154.

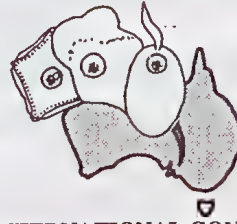
AUSTRALIA 1996

- **Sixth International Behavioural Ecology Congress**, Canberra. 29 September to 4 October 1996. Information: isbe6@anu.edu.au, or to ISBE6, Attention Andrew Cockburn, Division of Botany and Zoology, Australian National University, Canberra ACT 0200 Australia.
- **Ramsar Convention** to be held in Brisbane from 19-27 March 1996. The conference will celebrate the 25th anniversary of the meeting in the Iranian town of Ramsar where the conference text was agreed. See the article by Max Finlayson in the "Articles" section of this newsletter. Further information on the Convention is Bill Phillips from ANCA in Canberra - Fax 06-2500384, phone 06-2500777.)

- **The Scientific Savant in Nineteenth Century Australia: a Celebration of the Life, Times and Legacy of Ferdinand von Mueller, 22-24 September 1996.** Part of the Commemorative Conference Royal Botanic Gardens, Melbourne. This conference will include sessions on Australia/overseas scientific links; Intercolonial relations in science; The scientific botanic garden; Scientific explorations in Australia; Darwinism in Australia; Philosophies in Australia; Amateurs and professionals in Australian Science and Government Science; Scientific education. For more information contact Dr Tim Entwisle Phone 03-655 2300, Fax 03-655 2350, Email entwisle@botany.unimelb.edu.au.
- **Beyond the Floras, 26-28 September 1996.** Part of the Commemorative Conference Royal Botanic Gardens, Melbourne. This conference will include sessions on The future of taxonomy; Techniques and developments of importance to systematic botany; Applications of taxonomic information. For more information contact Dr Tim Entwisle Phone 03-655 2300, Fax 03-655 2350, Email entwisle@botany.unimelb.edu.au.
- **Ecological Society of Australia (tentative) 9-12 July, 1996, Townsville, Queensland.** Information from Ross Alford, Dept. of Zoology, James Cook University, Townsville, Qld 4811. Fax: 077-251570, Email: ross.alford@jcu.edu.au.
- **Second World Fisheries Congress, 28 July to 2 August, Brisbane, Queensland.** Information from Congress Secretariat, PO Box 1280, Milton Qld 4046. Fax: 07-3691512.
- **INTECOL V International Wetlands Conference, 22-28 September 1996, Perth, Western Australia.** Information from Dr Jenny Davis, Fax: 09-3104997 Email: davis@essun1.murdoch.edu.au.
- **7th International Conference on Small Freelifving Amoebae, 7 - 12 January 1996, Adelaide Women's and Children's Hospital, Adelaide, South Australia.** Contact: Mr Bret Robinson (Convenor) FAX 61-8-2590228 (Also separate Announcement in this Newsletter)

OVERSEAS 1996

- **Victoria Falls Conference on Aquatic Systems**, 15-19 July 1996, Elephant Hills Hotel, Victoria Falls, Zimbabwe. The conference is jointly organised by the Southern African Society of Aquatic Scientists, the River Basin Management Technical Division of the Water Institute of Southern Africa and the Water Engineering Division of the South African Institution for Civil Engineers. The conference will focus attention on the monitoring and management of our water resources, aiming to provide a multidisciplinary overview of aquatic ecosystems and resource management. Abstracts should be submitted by 30 June 1995. Enquiries and registration forms from Ms Lesley Stephenson, Conference Secretary, Ph: +27-011-716-5091, Fax: +27-011-339-7835, Email: stephenson@egoli.min.wits.ac.za.
- **WISA 96** (Water Institute of South Africa), 13 to 20 May 1996, Feather Market Centre, Port Elizabeth, South Africa. Information from: Conference Planners, PO Box 82, Irene, 1975 South Africa. Phone: Pretoria (012) 63-1681 or Fax (012) 63-1680.



**7TH INTERNATIONAL CONFERENCE
ON SMALL FREELIVING AMOEBAE**

7th International Conference on Small Freelifving Amoebae

Venue: Adelaide Women's and Children's Hospital

Dates: 7-12 January, 1996

This specialist meeting on the biology and pathogenicity of *Naegleria*, *Acanthamoeba* and other small amoebae will be a forum for all environmental and medical scientists or molecular and cell biologists who may be interested in these organisms. There will be sessions on their ecology, biogeography and evolution as well as on virulence, pathology and the epidemiology of the infections caused by some species. Papers will be arranged thematically and single-day registration will be available.

More detailed information on the program and registration papers are available by fax or airmail from:

Mr Bret Robinson (Convenor)
7th International Amoeba Conference
C/- Australian Water Quality Centre
Private Mail Bag, Salisbury
South Australia 5108 AUSTRALIA
FAX 61-8-2590228

ASL VOLUNTEERS

The following people have volunteered to speak as experts on behalf of the ASL. If you wish to be included on the list contact:

Dr Richard Marchant (ASL Secretary)

Phone: 61-3 284 0218

Fax: 61-3 416 0475

Email: rmarch@pioneer.mov.vic.gov.au

Name	Area of Expertise	Phone
Prof. A.Arthington	in-stream flows, ecology of exotic fishes, conservation of rare fishes	
Dr P.Boon	bacteriological issues, wetlands	03-3652214
Dr A.Boulton	intermittent streams, hyporheic zones, Flinders Ranges streams	067-733760
Dr M.Brock	temporary wetlands, aquatic plants	067-732578
Dr S.Bunn	stream ecology, ecology of riparian zones, biomonitoring	07-8757407
Dr G.Closs	ecology and conservation of freshwater fish, upper Murray River	
Dr Tim Entwisle	taxonomy and ecology of freshwater macroalgae	03-6552313
Dr M.Finlayson	wetlands, Ramsar convention	
Dr T.Grant	platypus biology	
K.Hortle	impact of mining, impact of development in SE Asia and PNG on rivers	03-8742597
Dr P.Horwitz	conservation of freshwater invertebrates	09-4055558
Dr P.Humphries	fish ecology, in-stream flows	060-431002
Dr J.John	blue-green algal blooms in WA, artificial wetlands	
Dr P.S.Lake	stream ecology, conservation of freshwater biota	03-9055653.
Prof. J.Laybourn-Parry	plankton microbial ecology, carbon cycling in lakes, Antarctic freshwater systems	03-4792278
Dr R.Pearson	tropical freshwater ecology	077-814262
J.Puckridge	ecology of arid zone rivers, ecology of freshwater fish	08-3034455
Dr N.Rea	hydrology of wetlands, aquatic plants, constructed wetlands	02-5514425
Dr L.Townley	groundwater - surface water interactions	09-3870329
A/Prof K.F.Walker	Murray - Darling basin rivers	08-3035595
Prof. W.D.Williams	salt lakes	08-3034455

BOOK REVIEW

A Sermon for Limnology

FH Rigler and RH Peters. 1995. *Science and Limnology*. Excellence in Ecology 6. Ecology Institute, Oldendorf/Luhe, Germany. ISBN 0932 2205. 239p.

Did you read Robert Peters' book *A Critique for Ecology* (Cambridge UP, 1991)? It was a discourse on the past, present and future of ecology as a science, and generally well-received despite some vitriolic reviews. Most would agree that Peters was more often right than wrong. At the very least, he succeeded as a *provocateur*.

This new book covers similar ground, but has some distinctions. It is part of a series by winners of the *Ecology Institute Prize* (David Cushing, Paul Ehrlich, Tom Fenchel, Harold Mooney, Robert Paine, Gene Likens and Edward Wilson). Robert Peters (McGill University, Montreal) received the Prize in 1991, honouring his work on phosphorus dynamics in lakes and his book *The Ecological Implications of Body Size* (Cambridge UP, 1983). On this occasion he has enlisted the posthumous aid of his mentor Frank Rigler, who died in 1982 but whose unpublished notes here take new flight. The book contains ideas from both, and curiously (and a little distractingly) is written in the first person singular. The chimeric author, Peters suggests, is neither one or the other, but both.

The theme is that ecologists have collected many data but failed to develop predictive theories; future research must focus more on empirical, holistic approaches that foster prediction. To set the scene, the first three chapters assemble a philosophic framework that includes discussion of the differences between *facts* and *theories*, *induction* and *deduction* and *empirical* and *explanatory* theories. A line of ascent is drawn from Aristotle to Bacon and Hume and the logical positivists, and on to Popper and Kuhn. The nature of paradigms and revolutions is illustrated by comparing science and pseudo-science (thus, belated success for the unconventional ideas of Mendel, later Wegener, but not for those of Velikovsky).

Against this backdrop the disciplines of ecology and limnology are wanting. Ideas like the *niche*, the *competitive exclusion principle* and *evolution by natural selection* are inherently tautological and not falsifiable (chapters 4-5). Data gathering has been prolific but poorly directed-witness the confused literature on phosphorus-chlorophyll relationships and secondary production. Ecologists do their work superficially, as if they did not care about the reproducibility or validity of their results. "The Ecologists' Disease" is a disinterest in prediction.

Limnology pioneered the formulation of ecological concepts because lakes are well-defined systems, or so it was once believed.. Stephen Forbes' concept of "the lake as a microcosm" proved restrictive when it was realised that the boundaries are better

drawn around watersheds than shorelines. The change cost limnology its pivotal position, but now "predictive limnology is a flourishing sub-discipline", say Rigler and Peters (p93), "and limnology is once again showing the way, this time towards a new science of predictive ecology".

We should look again at holism and reductionism. The problem of seeking to explain variance in an entire ecosystem is impossibly difficult, they say, and a *reductionist* approach is needed (chapter 7). This must embrace all significant components of a system, and all significant interactions between them; we must study the properties of the system, not those of its parts (this appears to lie somewhere between true holism and true reductionism).

The limnological literature is a source of inspiration, but full of intellectual traps. Much of it is pedestrian, and confined by the prevailing paradigm. We need to re-think our goals and methods in education. The future is not in "big science" (people don't work that way) or "the multi-disciplinary approach" (most disciplines tend to reductionism). The future is grim, unless we change our ways (chapter 15).

The "creative alternatives" include syllogism and analogy (but beware the traps of deductive logic), the capacity to ask fresh questions ("think like a child") and especially "empirical limnology" the pursuit of predictions. The empirical approach extends the work of Vollenweider and Dillon, and Rigler and Peters, on the phosphorus-chlorophyll relationship ("how green is my lake?"). "None of these relations are perfect", they say (p147), "but none of us expected perfection. What is far more surprising is the speed and ease with which empirical theories were developed for a broad range of limnetic phenomena. This rapid success gives me hope that many ecological questions can be similarly resolved ... If so, we may see a generation of applied ecologists who, like physicians and engineers, have valuable skills to offer, and a generation of ecology texts that are more similar to engineering handbooks than to philosophical treatises. Perhaps then humanity will be worthy and capable of the planetary stewardship we have assumed."

In the Preface, the late Frank Rigler asks the reader to evaluate the book as a sermon. A good sermon, he says, must not be too long; it must be internally consistent; and it must be comprehensive. He does not suggest that it should be persuasive, thought-provoking or inspiring, but the book has some claim to score in each respect.

This reader felt sympathetic, but not persuaded, that empiricism should be the general prescription for progress. Special circumstances influenced the success of the phosphorus loading models, and those would not apply to all other ecological problems. Our inclination to misunderstand statistical methods and ideas makes it difficult to believe that regression and ANOVA models are the answer. And cannot predictions be qualitative, rather than quantitative, and still have heuristic value?

I think that the oft-mentioned problems of scale must be part of any new understanding, and until we have a means for conceptual travel across space and time,

whilst maintaining a sense of direction and perspective, we will often founder in pointless arguments. When Rigler and Peters say (p47) that we cannot predict the effects of a dam constructed across a river, they are both wrong and right-wrong because at some levels of scale we certainly can predict those effects, and right because at other levels we cannot. Our ability to predict obviously is related to the scope and complexity of the question.

And the implicit notion that the science of ecology is the key to the world's problems is silly. The same commonsensical ability to predict the large-scale effects of a dam tells us that if, for example, we want to solve problems caused by pollution, we must intercept the pollutants. That is an ecological solution to the problem. Ecologists are too ready to stray into the realms of economists, sociologists and politicians who tell us that it is economically, socially or politically unacceptable to stop polluting that we must continue to pollute but do research that will overcome the problem in some other way. This is a vital problem, but not wholly an ecological one. I hope that the future of ecology (and limnology) *as a science* lies in another direction.

One sermon invites another. A *provocateur*, did I say? Even so, I commend the book to you. You may splutter at some of its hyperbole, wriggle uncomfortably over some of its accusations and ponder whether it has the right answers. But it is an interesting polemic, and the authors surely are right to say that ecologists should indulge more in professional introspection. May you find in it some inspiration, and help the rest of us to see the way ahead a little more clearly!

KF Walker

Department of Zoology, University of Adelaide



The safe and easy game of ecology—a rationale for a research proposal
(Rigler 1982: *Trans. Am. Fish. Soc.* 111, 121).

THESES

(Departments wishing to publish titles of completed postgraduate theses should send lists to the Editor)

School of Environmental Biology Curtin University of Technology

YEAR	STUDENT	TITLE OF DISSERTATION	SUPERVISOR
MSc			
1993	S Hellenen	Diatom assemblages as indicators of water quality of the wetlands of the Swan Coastal Plain	Jacob John
Honours			
1990	J Nowell	Microbial communities associated with stromatolites at Shark Bay, WA	Jacob John
1991	J T Long	Algae as indicators of water quality in artificial wetlands at Capel, WA	Jacob John
	M M Handley	The biota of inland salt lakes of Kambalda and Esperence - a comparative study	Jacob John
	V S Campagna	A comparative study of the microbial mats at Lharidon Bight and Hamelin Pool, Shark Bay, WA	Jacob John
1992	D Johnston	Palaeoecological studies on Forrestdale Lake based on diatom assemblages	Jacob John
	W A Holliday	conservation biology of an isolated stand of mangroves at Bunbury, WA	Jacob John
1993	G Hanna	Diatoms as indicators of salinisation in the Avon River	Jacob John
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